RAILROAD GAZETTE

SATURDAY, AUGUST 2, 1873.

Caum's Combination Buffer and Draw-bars.

The accompanying engraving illustrates an invention made by Mr. E. L. Caum, of Patterson, Pa., and patented by him December 3, 1867. (No. 71,580.) In his specifications Mr. Caum describes his invention as follows, the figure referred to being a view of the under side of a car with the invention applied:

"The invention consists of a novel method of combining the draught-rods with the bumpers and a buffing apparatus, whereby to prevent the injurious slacks and strains to which the cars are subjected under the common mode of construction.

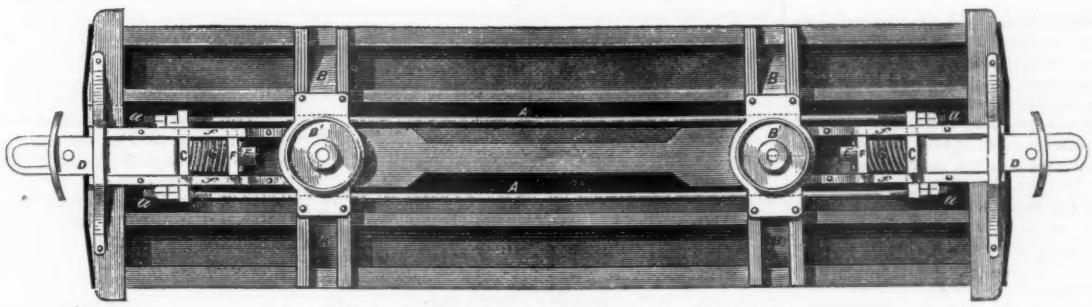
"*AA* are parallel draught-rods, situated at either end of the center plates, *B' B'*, which receive the king-bolts to connect the coach or car to the truck. These draught-rods may pass through apertures in the frame-work, *B*, of the truck, and are thus guided in rectilinear paths during the longitudinal sliding motion which they receive. They may also be supported, and prevented from sagging at the center, by a hanger depending from, or a staple inserted into the under side of the truck; and, for convenience in applying them to the car, each draught-rod may be made in two parts, to be attached together at the center of the car by a bolt-and-jaw connection, or otherwise. At one end the rods *A* are provided with nuts or heads, *a*, and upon their opposite ends are cut screw-threads, for the reception of the nuts by means of which the said rods are confined within and adjusted in relation to the coupling plates *CC*. The rods *I* usually make 1¼ inch in diameter, and the parts upon which the nuts are fitted 1¼ inch in diameter. These dimensions, however, are of course varied according to the weight to be drawn. The holes in the plates through which the ends of the rods *A* pass, are sufficiently large to permit said plates to move or play freely therein. *DD* are the bumpers, arranged to slide in grooves at the ends of the frame. *B*, and *E* are what may be termed draw-bars, united to and rigidly projecting from the respective bumpers *DD*. Each of these draw-bars *E* passes through a hole in the middle of its corresponding plate *C*, and through another hole in the plate *F*, and the draw-bars *E* are held therein by a head, nut or key, as may be convenient. The motion of the plates *C* and *F* is limited in one direction by the spring *G*, when fully contracted, and in the opposite direction by their respective abutments. They are held in working position by the guides *f f*. About each draw-bar *E* there is coiled a spring, *G*, whose opposite ends abut against the movable plates *C* and *F*. The bumpers *B* are connected to those of the adjacent cars or coaches by links and pins in the customary manner.

"The above described method of coupling the bumpers, draw-bars, draught-rods and buffing apparatus possesses peculiar and important advantages, and effectually subserves the objects which have not hitherto been obtained.

"The application of springs to the running gear, to avoid shocks, is not regarded as a new expedient; but antecedent devices of this character are either liable to the objection that they subject the framework to injurious strain in the act of drawing the cars, or expose the draught-rods to constant liability to jamming and bending when the cars come together, or they involve those injurious characteristics jointly. Now, with my improved draught apparatus, it will be perceived that, in use, the frame is not subjected to strain by applying, at or near one end of the car, the draught or drawing power required to move the car (as is commonly the case); that the cars are not liable to undue shocks in starting, stopping and coming together, and that the draught-rods, *A A*, are not liable to be bent or jammed by force applied to their opposite ends when two or more cars are brought together. Thus, when one of the bumpers, *D*, together with its draw-bar, *E*, is drawn forward by the engine, the power is not immediately transmitted to that end of the car, but the rods *AA*, and rear plate *C*, and foremost plate *F* are drawn forward, contracting the springs *GG*, and gradually applying the power to the abutment at the end of the car opposite to that where the draught is applied to the forward bumper. In this way the car is moved by a pushing action, or, in other words, impelled from the rear, which entirely obviates the dismemberment or injury which the former undergoes when pulled at the forward end, as is commonly practiced. In backing the same advantage arises, from the fact that the cars are likewise pushed or impelled from the front. The cars which are coupled with and string behind the forward car are drawn entirely by the draught apparatus, and none of the weight or strain involved in drawing them is appreciated by the forward car. When the cars come together the yielding bumpers *D* transfer the force to the spring *A'*, and the plates *C* slide back upon the rods *A*, which are not subject to any bumping or jamming action whatever, said rods being shorter than the car frame."

Mr. W. D. Moore, of Wilkesbarre, Pa., is the agent for the introduction of this invention.

—At the annual meeting of the Vermont Valley Railroad Company, at Bellows' Falls, Vt., July 21, the following directors were elected: S. M. Waite, F. A. Nash, William H. Rockwell, Jr., Brattleboro, Vt.; Frederick Billings, Woodstock, Vt.; D. L. Harris, Springfield, Mass.; W. P. Burrill, Hartford, Conn.; Gouverneur Morris, Morrisania, N. Y. The board elected officers as follows: President, Gouverneur Morris; Vice-President, S. M. Waite; Treasurer and Clerk, F. A. Nash; Solicitors, Field & Taylor, of Brattleboro. The legality of the meeting and election is to be contested.



CAUM'S COMBINATION BUFFER AND DRAW-BARS.

Contributions.

Organization of a Railroad Supply Department.

[The following plan for the organization of the supply department of a railroad was drawn up by Mr. John M. Goodwin, C. E., as a report to the manager of an important railroad, on which the plan described has since been substantially adopted, we believe.—EDITOR RAILROAD GAZETTE:]

It is obvious that an efficient, judicious and honest administration of the affairs of the supply department of railway service is of the highest importance.

An efficient administration would secure the filling of all proper requisitions with promptness and certainty, so that delays and deficiencies that might cause damage would not occur.

A judicious administration would refuse to fill ill-timed, improvident and otherwise objectionable requisitions, and an honest conduct of affairs would seek the establishment of a system of checks under which peculation would be impossible.

At your suggestion I have attempted to devise a plan for the government of the supply department of the line under your management, the features of which are hereinafter given. It will be well before considering that plan to notice the points wherein the existing mode of doing the business in question is defective or mischievous.

Attached hereto is the form now used for requisitions on the supply department. The instructions printed thereon stipulate:

1st. That "requisitions will be drawn only by heads of departments or such officers as they shall designate." "Officers" thus "designated" are of course considered as acting in the place of those who so designate them.

I. As only heads of departments sign requisitions, the inevitable result of the pressure of official position is a disinclination, on the part of the person or board whose duty it is to criticise requisitions, to cut down or to refuse to fill a requisition drawn by an officer who, because of his holding his position, must be supposed to know what is needed in his department, unless, indeed, such person or board has, through personal inspection and practical knowledge, a competent intimacy with the wants of the department on account of which the requisition is made, and has at hand the data from a consideration of which the deduction is inevitable that the requisition is not judiciously drawn.

This disinclination must result in the formal approval by the examining board, as now constituted, of many requisitions that should be modified.

And the head of a department, say, for instance, a Division Superintendent, stands in many cases in a relation to the trackmaster, master carpenter or station agent on his division, who makes the original demand for supplies, very similar to that occupied by the examining board in regard to the Division Superintendent; he is not personally familiar with the details of the wants of his trackmaster, carpenter or agent; he knows that the trackman wants spikes and that the carpenter wants nails, but he cannot say just how many kegs of spikes or nails are needed; his duties are many, and of many kinds, and he cannot keep "up" in all the minor details. He hesitates to reduce the amounts in a requisition, even when they appear to him large, for the same reasons that influence the board of examiners at headquarters.

The printed instructions specify, 2d, That requisitions "will be forwarded on the first of each month, and at no other time during the month unless unavoidable."

II. In ordering supplies once a month, the person making a requisition, with a view of getting enough to last him through the month, generally asks for more than he actually needs; and, getting it unnecessarily large, is apt to be lavish in expenditure. The percentage of unnecessary expenditure is greater at points where small quantities of material are used than at places where large amounts are legitimately consumed, but the tendency exists in all cases.

Under the rule just quoted the road lays in at one time a full month's supply of material, costing many thousands of dollars, and assumes the risks of breakage, leakage and loss attending the storage of the same, in places many of which are exposed to danger from fire.

As an example of the amounts of goods ordered at one time under the foregoing rule, I cite the requisition of the ——— ——— car shops for the current month, which calls for, among other things, 230,000 feet of 1in., 1¼in. and 1½in. pine lumber; 5,000 gallons oil and 6,000 lbs. waste (with 1,750 gallons oil and 700 lbs. waste on hand); 58 tons extra refined merchant iron with 7 tons on hand); 34,000 (car) bolts; 69 dozen files; 250 gross iron screws; 57 kegs nails, assorted sizes, and 1,100 car-wheels (with 130 on hand).

III. The printed instructions further require that the "quality, make, kind, size or pattern" of the things ordered be stated, but in practice this is only imperfectly done.

IV. The instructions do not require an explicit statement of the use to which the supplies are to be put, and a Division Superintendent, consolidating into one requisition the list of articles wanted for his entire division, heads his order, "Articles to be forwarded to sundry places," and calls for large quantities of material, without giving any intimation as to where they are to be used. As an instance of this, the requisition of the Superintendent of the ——— Division, for the current month, calls for 60 kegs cut nails, 4 dozen Arnold's copying ink, 6 dozen red ink and 9 boxes window glass, as well as many other things, without specifying where they are to be used. He also calls for 250 kegs railroad spikes (having 25 on hand) and 50 kegs track bolts. He should be required to state explicitly what he wants these things for. The examiner of the requisition just quoted readily understands that railroad spikes and nails, and so forth, are inevitably expended in the business of the road, but he has no means, under the present system, of determining whether 200 kegs of spikes would not be an ample supply where 250 kegs are ordered.

Beside the consolidated requisitions, such as that just quoted, division superintendents often make orders for goods to be sent direct to some specially designated person, as a station agent, for instance.

V. When a requisition is drawn up by the authorized "head of a department" it is forwarded to the Supply Agent, who passes it to the examining or auditing committee. This committee, having approved it, pass it back to the Supply Agent. This officer then makes orders for the several articles required, sending them to such dealers in those articles as he may select. The forms are bound in a book. A stub duplicate of each is retained in the book. The dealer receiving the order ships the goods as directed, taking shipping receipts from the railroad company. He then makes original and duplicate bills of the goods, placing on them the designating number of the Supply Agent's order, and sends them to the Supply Agent with the shipping receipt. The Supply Agent then compares the bills and receipts thus rendered with the "stub" in the book aforesaid, and examines prices by comparison with price-lists, and, finding everything correct, "passes" the bill, which is then entered in a journal which contains a separate account for each person authorized to sign requisitions. The duplicate bill is then attached to a form of invoice and forwarded to the person to whom the goods have been shipped.

On receipt of the goods and this invoice, the consignee compares the two and returns invoice to Supply Agent, with note of any variations or deficiencies in quantities or quality. At the close of the business of the month, the journal is footed up and compared with the totals of the respective invoices, and the invoices are sent to the persons who have received the goods, accompanied by a form of certificate, upon which is shown the entire business done with each such person, respectively, during the month. Notwithstanding the rule restricting each person to one requisition per month, the exigencies of the service of the road often make it necessary for an officer to draw several requisitions during a month, and this certificate gives a recapitulation of the several invoices corresponding with the several requisitions.

The certificate, being signed by the officer who has received the supplies and under whose direction they have been used, is returned to the Supply Agent with a *distribution* of *expenditure* indorsed thereon.

The Supply Agent sends monthly to the Auditor a statement of the total purchases and distributions on requisitions, and with this statement sends the certificates aforesaid, which should agree with the statements of distributions. The balance should show the stock in the supply store.

The originals of the bills of goods purchased are attached to voucher forms, and those vouchers having been recorded in supply office and approved by auditing committee, are sent to the Treasurer for payment, the supply office taking receipt of Treasurer for them.

In addition to the monthly statement of total purchases and distributions on requisitions, a statement giving each voucher copied in detail is sent by the supply office to the Auditor.

VI. To recapitulate: the herein suggested objections to the system now in force in the supply statement are:

1. That only heads of departments sign requisitions.

2. That, under the rule, requisitions are made in advance to cover all supplies estimated to be needed for a month.

3. That persons drawing requisitions are not required to explicitly describe the things they need, nor to explicitly state the use to which the articles ordered are to be applied.

4. That the Supply Agent receives the requisitions direct

from the drawers and before they are examined by board of "audit" and subsequently has custody of the original requisitions.

5. That requisitions are approved and ordered filled without a sufficiently close examination into the question of the expediency or necessity of the issue of the supplies called for.

6. That the Supply Agent is not specifically restricted in his selection of the parties from whom to purchase supplies.

7. That "stub" copies instead of press copies of orders are made.

8. That the inspection of goods shipped by dealers direct from their stores to points on the railway is insufficient, and that no invoice accompanies the goods to their destination.

9. That the "distribution of expenditure" (as per indorsement on form of certificate) is made by the head of department who orders supplies and whose subordinates expend them.

VIII. In a reconstruction of the supply department that would eliminate the above objectionable features, the following provisions would be made:

1. That requisitions be drawn and signed by the persons under whose immediate charge and control the material called for is to be expended, that is to say, conductors, station agents, trackmasters, foremen in charge (standing in the position of military officers, of whatever rank on duty in charge of detached posts: a "shop" has several detached shops; each detached shop could be a "post" in the above sense) and heads of office.

Under this rule a Division Superintendent would make requisition for only what he wanted for use in his own office, unless indeed he were in special charge of some work usually attended to by a track-master, master carpenter on buildings, station agent or other subordinate.

A head of department would in like manner make requisition for supplies only for his own office. Passage tickets, as being vouchers for money, are not looked upon as supplies in this connection.

Each person signing a requisition would also sign certificate upon honor that the things ordered "are essential to the proper and economical conduct of the business of the road."

The object of this arrangement is to bring into the general office the evidence of the origin of the order of goods. The indorsements on the original requisition, hereinafter provided for, would serve as cumulative evidence of the propriety of the order, or as suggestions toward a proper modification of the same.

And here let us follow the requisition to the hands of the person or board whose duty it will be to scrutinize each item in it, and, if satisfied that it is properly drawn, to approve it.

The requisition, having been drawn, signed and certified, as specified, would be forwarded to the officer at the head of the department in which it originated; this officer would thoroughly inform himself as to its purport, and indorse on it any remarks as to its character that he might see fit to make, and, after signing a certificate printed on the form, to the effect that he "has examined and recorded the accompanying requisition," would record the requisition and his remarks aforesaid in a proper book kept for the purpose, and forward the original paper, direct, to the person or board appointed to "audit it.' We will presently take it up again at this point, turning now to the provisions of the reorganization, viz.:

2. That requisitions be made as the supplies are wanted, care being taken to maintain an equable, sufficient working stock, and to avoid accumulating unnecessarily large amounts of material.

3. That persons drawing requisitions be required to fully and explicitly describe the things they need, and to give full and explicit information concerning the use to which they are intended to be applied; and, furthermore, that all persons signing requisitions shall write out, in full, their names and official or other designation, and the name of the station or place at which it is desired to have the goods or material delivered.

4. That (as aforesaid) requisitions be forwarded, direct, to the person or board appointed to examine and "audit" the same, and that the original requisitions remain with said person or board.

5. That for the purpose of affording to the board of audit a ready means of information concerning the condition and necessities of the several stations and shops, and of the track, bridges, buildings and equipment of the road, the officer at the head of the Bureau of Inspection and Statistics be *ex officio* a member of said board; and that, reciprocally, to enable him more readily to compile the statistical tables relating to supplies, said officer have charge of the clerical force of the board of audit.

6. That in order to secure to the railway company the most favorable prices and terms in purchasing supplies, the President of the company advertise, from time to time, for proposals for furnishing, on the orders of the Supply Agent, goods of the several kinds in use on the road, and contracts being made with the parties submitting the most favorable bids, that the Supply Agent be instructed to draw his orders on those parties.

No expensive advertisements would be necessary, as the list of goods, in classes, would be prepared in the company's printing office and sent to applicants.

7. That a revision of the forms now in use be made.

8. That dealers bidding, as per provision 6, when awarded contracts be required to furnish a sample of each article in the classes covered by their contracts; such samples to be sealed by an inspector in the employ of the railway company, and to be held by the dealers open to examination by such inspector at any time that he may need to compare them with articles furnished; also to send a full and clear invoice with each lot of goods shipped to the company.

9. That the "distribution of expenditure" be made by the audit office of the supply department from the information contained in the requisitions, and no requisition be approved that does not furnish the information necessary for making such distribution. As the matter is now arranged it is possible for a party so minded to render an entirely illusory account.

We will now take up the requisition at the point where it was left, *i. e.*, at its delivery into the hands of the board of audit.

The board, after the system proposed here has been in operation a month or two, and after proper statistics, derived from inventories and inspections, have been collected, will have at hand ample information from which to form opinions concerning the character of requisitions.

Basing their opinions upon this information, they will examine and modify or approve the requisitions as may be deemed best for the interest of the road.

The original requisition, having been approved as drawn, will be numbered and have indorsed upon it the proper memoranda for distribution of expenditure.

A letter will then be addressed to the Supply Agent to this effect:

"OFFICE OF BOARD OF AUDIT OF REQUISITIONS,
————, 1873.

"*To A. B., Supply Agent:*

"SIR: You will please order for the use of the company the articles specified below, to be forwarded to John Doe, Station Agent at —— station, to fill requisition No. 317, on file in this office. Per order of the Board of Audit of Requisitions.

"RICHARD DOE (one of the Board of Audit)."

A press copy of this letter will be made and kept in audit office and the letter sent to the Supply Agent (the original requisition being carefully filed in audit office), and the Supply Agent will then, under provisions 6, 7 and 8 of this scheme, proceed to fill the order.

In case it is necessary to modify a requisition, the Board of Audit will (through the head of the department in which the same originated, who has a transcript of the same in his possession) make such inquiry into the facts in the case as may seem to them proper, and if a modification of the requisition is finally decided upon, the said head of department will be advised of the modification made, and will, in turn, inform the drawer of the requisition of the modification, and of the reasons given for the same, and will, by advice, admonition, or otherwise, endeavor to prevent the making of injudicious or unnecessary requisitions.

This direct connection of the more remote branches of the service of the road with the supreme authority at headquarters, in this as in other departments, is in my view essential.

The Supply Agent having filled out the order on the dealer for the goods called for by the letter of the board of audit, will retain press copy of the same, and will also forward to John Doe, who is to receive the goods, an invoice of the things ordered, on the back of which invoice will be printed a form of receipt, which, after receiving the corresponding goods, John Doe will sign and return to the Supply Agent.

In case of shortage, breakage or deficiencies in quality, these will be noticed in full on said receipt, and the matter adjusted by the Supply Agent as now done, with the addition of comparisons of goods with samples if necessary.

In the office of the Supply Agent separate accounts are now kept only with those officers (heads of departments) authorized to sign requisitions, and as before specified each such officer makes his own "distribution of expenditure;" hence arises the objection (9th) made before.

Under reorganization, accounts would be opened in the Supply Agent's office with each station-agent, track-master, foreman of shops, etc., and the monthly statements of the supply department would show details where now they show only aggregates, inasmuch as they would give us the amounts supplied to each station, shop, division of track, etc., instead of the gross amount supplied to a head of department.

At the close of each month's business the Supply Agent would make his detailed statement aforesaid, and submit it with his vouchers (dealers' bills) to the board of audit.

That board would compare statements and vouchers with the books in their office, and (to check prices) with existing contracts. Then, referring to the original requisition, they would "distribute" the "expenditure," and, everything being found correct, they would pass the statement to the company's Auditor, having gathered from them in their passage all the statistical information to be derived from them, the head of the Bureau of Inspection and Statistics being, as before specified, in charge of the clerical force of the board and attending to the compilation of such matters.

I am informed that experience has shown that it is desirable to keep a supply of certain goods on hand in the supply-store. For these goods the Supply Agent would make requisition in same form as any other agent; the head of his department would be the board of audit of the supply department.

The transfer of supplies and articles manufactured in the company's shops from those shops to other departments of the road is now carried on by a method treating the shops from which the articles are taken much as if they were "dealers" selling their goods to the company's Supply Agent, who, constructively, receives them into his store and thence issues them to the other shop or department where they are needed, the supplying shop being credited and the receiving shop charged with the value of the goods. Such transfers should be made entirely as if the supplying shop was a "dealer," in which case the value of the manufactures or articles supplied would show as earnings of the shop supplying them.

When empty barrels, scraps or other material is sold from a shop or department of the road, a "collection voucher" is made and sent to company's Auditor, who charges supply department, and when the money for the goods is paid, by the purchaser, to the Treasurer of the company, the amount is credited to the supply department.

I do not learn that any "audit" of these collection vouchers is made, further than as above stated.

The sale of old or other material belonging to the road should be made only upon order of the President, and under his direction.

The success of the plan here proposed will depend largely on the efficiency of the Bureau of Inspection and Statistics, the organization of which has been suggested in former communications.

Railroad Inspection and Inspectors.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of 19th July, just to hand, you reproduce a letter said to have been written a year ago to a prominent Western manager by Mr. J. M. Goodwin, in which he advocates "the introduction of something *new*" into railroad management, to wit: A system of inspection. Possibly this idea was original with Mr. Goodwin, but if in January, 1872, he was a reader of the RAILROAD GAZETTE, he probably in the issue of January 27 read as follows, under the heading: "Notes on the Management and Discipline of American Railroads. By a Hindoo:" "In India on the line I served, the manager had a staff of inspectors continually traveling over the line, some with special objects in view, some with no special aim; but all taking notes. They were ubiquitous. No one could tell when one might not appear; no man neglecting his duty felt safe; every man doing good service felt he was not unnoticed. These inspectors, of which corps the writer was a member, were expected to know thoroughly the policy of the manager, the liabilities and engagements of the company; they were expected to have at their fingers' ends all the rules and regulations of the company. They inquired on the spot into all complaints, and made full reports, showing who was to blame. They investigated on the spot of its occurrence every accident, for which purpose they had power to compel the attendance of any one who could throw light on it. Periodically they inspected stations, having printed forms of report to fill in. Their supervision extended to every department and left no corner unsearched. They differed from assistant superintendents in that the inspectors wielded no executive power; the assistants did. Wherever the inspector saw carelessness or willfulness he reported the case direct to the manager. Where he saw ignorance, he instructed, being always able to quote 'chapter and page.' Where he saw gross stupidity and unteachableness, he reported accordingly. These informations filed in the court of the managers were never acted upon *ex parte*. Invariably both sides were heard, and so noi njustice was done."

If Mr. Goodwin had not read my article when he addressed Messrs. Watson and Hatch, the coincidence is remarkable.

No road can be efficiently managed without a system of inspection, in this country more especially, where we find so many general managers and superintendents who know as near nothing as possible of the details of railroad management, and have no time to study the principles of it.

Yours truly, HINDOO.

[Mr. Goodwin, we believe, had not been accustomed to read the RAILROAD GAZETTE until about a year ago. That a system of inspection should have suggested itself to him will not seem in the least strange to those who know him and know how fruitful his mind is, and long has been, in plans for improvements in organization and working, and how largely for years he has been engaged in duties which virtually embraced inspections, though not often called by that name. The *idea* of inspection can hardly have failed to occur to any railroad man in the least familiar with army organization, and inspection in a more or less formal and systematic manner is practiced on most railroads. What is needed is the organization of a regular system of inspection and a better appreciation of its value. "Hindoo's" relation of his Indian experience and description of the Indian system, and Mr. Goodwin's plans and American experience and reports have doubtless done something (and both, we hope, are destined to do more) to supply this need.—EDITOR RAILROAD GAZETTE]

To Measure a Line which Cannot be Chained.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In last week's number of the GAZETTE I notice a somewhat complicated mode of triangulating across a stream.

My method is to first establish a point on the opposite side of the stream on the center line at any convenient point; then with the transit locate a point perpendicular to a known point on the center line over which the instrument must be set; then deflect from the perpendicular line to point on center line on opposite side of stream, note the deflection and turn back from perpendicular the same deflection, and measure with tape or chain. The distance across the stream must necessarily be equal. A. K. HARVEY,

Resident Eng., Newark, Delaware & Northwestern Railway.
GAMBIER, Ohio, July 24, 1873.

Meeting of Railroad Managers at St. Louis.

An adjourned meeting of managers and general ticket agents was held at the Southern Hotel, St. Louis, July 24. Delegates were present from the Chicago & Alton, Atlantic & Pacific, St. Louis, Kansas City & Northern, Hannibal & St. Joseph, Leavenworth, Lawrence & Galveston, International & Great Northern, Mississippi Valley & Western, Rockford, Rock Island & St. Louis, St. Louis & Iron Mountain, St. Louis & Southeastern, Ohio & Mississippi, Indianapolis, Bloomington & Western, St. Louis, Vandalia, Terre Haute & Indianapolis, Cairo & Vincennes, Indianapolis & St. Louis, Houston & Texas Central and Kansas City, St. Joseph & Council Bluffs companies. The Kan-

sas Pacific, Atchison, Topeka & Santa Fe, Missouri, Kansas & Texas and Chicago, Burlington & Quincy were represented by letter or telegram. Mr. J. C. McMullin, of the Chicago & Alton, was Chairman, and C. B. Peck, of the Leavenworth, Lawrence & Galveston, Secretary of the meeting. The committee on resolutions reported the following resolutions and agreement, which were adopted:

Resolved, That from and after the first day of August, 1873, the whole system of issuing free passes over and upon the roads represented at this meeting, shall be abolished and discontinued, and that after that date no free passes or clergyman's half-fare tickets, or other tickets, for which regular passenger fare is not paid, shall be issued, directly or indirectly, in any form, by any railroad company here represented, or its agents, over its road, or any part of the same, to any person or persons, or for any purpose whatsoever; but that, aside from the officers, agents or employees of said railroad companies, while traveling on their own road, and while employed in the service of their own respective companies, all persons and classes of persons shall alike be required to pay the usual and established fare, except as hereinafter provided.

1. This agreement shall not extend to cases in which any of the companies signing this agreement are bound to issue passes by virtue of leases or by existing written contracts.

2. It is understood that to constitute an employee entitled to the privilege of passes under this agreement, the person employed shall receive a regular salary on the pay-rolls of the company.

3. That all passes and half-fare permits which have been issued prior to this date, may remain outstanding and in force till the 31st day of December next, unless they sooner expire; but none to be renewed or others issued.

4. In case any complaint or violation of the provisions of the foregoing resolution or agreement shall arise between the parties hereto, the same shall be referred to a board of three arbitrators to be nominated by the chairman at this meetng, and confirmed by a vote of the convention; and said arbitrators may pass upon such complaint, and their decision shall be binding unless appealed from by the party or parties aggrieved; and in such case a meeting of representatives of all the lines parties hereto shall be held, at which meeting such complaints shall be submitted for final action.

The arbitrators may at their discretion require answers under oath. In case of absence or failure to act of one of the arbitrators, the other two may select a third and disinterested party, who shall be the president or superintendent of one of the roads parties hereto.

5. The Board of arbitrators appointed shall consist of the following named persons: Robert E. Carr, President; Thomas Allen, of the Iron Mountain Railroad, and J. F. Barnard, of the Kansas City, St. Joe & Council Bluffs Railroad.

6. This agreement to take effect August 1, 1873.

The agreement was signed as follows, the several companies agreeing with each other "to keep strictly, to observe, maintain and carry into effect the provisions of the foregoing resolutions to their full meaning and intent:"

Chicago & Alton Railroad, by J. C. McMullin, General Superintendent; St. Louis, Kansas City & Northern Railway, by W. C. Van Horn, General Superintendent; Hannibal and St. Joseph Railroad, by O. S. Lyford, General Superintendent; Atlantic and Pacific Railroad Company, by E. H. Goodrich, Assistant General Superintendent; Leavenworth, Lawrence & Galveston Railroad Company, by Charles B. Peck, Acting Superintendent.

On motion, O. S. Lyford, of the Hannibal & St. Joseph Railroad, was appointed delegate to visit roads west of the Mississippi River and obtain signatures to the agreement.

The meeting then adjourned.

OLD AND NEW ROADS.

Missouri River, Fort Scott & Gulf.

Steel rails are to be laid on this road from Kansas City, Mo., to Olathe, Kan., 21 miles. This section of road is used also by the Leavenworth, Lawrence & Galveston road.

Wisconsin Midland.

It has been proposed to make this projected line (formerly the Oshkosh & Mississippi) a narrow-gauge road. The subject is now under discussion. The road is to extend from Oshkosh, Wis., southwest to Dubuque, Ia. From Oshkosh to Ripon, 20 miles, it has been completed sometime, and is worked by the Milwaukee & St. Paul Company.

Southern Minnesota.

Minnesota papers report that surveys are being made for the extension of this road to the western line of the State. The line surveyed crosses the Sioux City & St. Paul at Wilder's, and runs thence direct to Graham Lake in Noble County.

Taxing Railroad Land Grants in Michigan.

The last Legislature of Michigan passed an act making the lands held by railroad companies under grants from the General Government subject to taxation. Heretofore these lands have been exempt from all but special taxes imposed by the Government until they passed into the hands of purchasers. The different land-grant companies of the State have combined to contest this law. In order to make a test case, the Flint & Pere Marquette Company has applied to the United States Circuit Court at Detroit for an injunction to restrain the Supervisors of Osceola County from levying a tax on lands held by the company in that county.

It is claimed on the part of the railroad companies that the grant from the United States to the State of these lands for railroad purposes vested the State with a trust estate, and the State did not become absolute owner of the lands. The only use the State could make of them was to confer the lands on some railroad company, or itself sell the lands and confer the proceeds on a railroad company, to be used in constructing the railroad. The State elected to pass the lands over to the railroad companies rather than the proceeds, and it is claimed on the part of the railroads, that the State agreed, in passing the lands over to the railroad companies, that the companies (each company) should be taxed in the same manner and at the same rate only, as other companies organized under the general railroad law.

Another point is made, that even if this were not so the general railroad law of 1871 is itself a contract, exempting these lands for a limited period, which has not yet expired.

Another claim is that, under the constitutional provisions of the State, railroad companies can only be taxed by a specific tax, and that the money, when such tax is paid, is specially appropriated for educational purposes, and for that reason it is not competent for the Legislature to change the mode of taxation so as to have the money, when paid, for other purposes.

The companies interested in this case are the Grand Rapids & Indiana, the Jackson, Lansing & Saginaw, the Marquette, Houghton & Ontonagon, Chicago & Northwestern and Flint & Pere Marquette.

Atlantic & Great West

English papers of the 12th have the advertisement of this company offering at 94 an issue of $7,600,000 of 8 per cent. "Western Extension certificates" secured by the deposit with trustees in London of 76,000 shares of the Cleveland, Columbus, Cincinnati & Indianapolis Railway Company, and of 152,000 shares ($50 each) of the Atlantic & Great Western. The capital stock of the company is $14,991,275, and for these 76,000 shares, forming a clear majority, the Atlantic & Great Western has made provisional agreements. Heretofore these shares have had 7 per cent. dividends, at least, but the amount is now one-third more than it was in 1870. The last quotations for the stock were about 86 currency or about 74 gold. On the date of the advertisement the Atlantic & Great Western shares were quoted at 12 in gold in London, so that the shares which are to serve as security for the £94 invested in a certificate could be bought for about £86. These certificates can be exchanged July, 1, 1876, for the shares of the Cleveland Company. Erie and Atlantic & Great Western security-holders have the preference in the allotment of the shares.

Mississippi Valley & Ship Island.

The Vicksburg (Miss.) *Herald* says that this company has purchased 600 tons of iron, a locomotive and construction train, and the work of tracklaying will soon be commenced.

Union Pacific.

The report of the Land Department for the month of June shows sales during the month of 10,712.57 acres for $53,198.49, an average of $4.96 per acre. The total sales of land up to June 30, 1873, have been 736,045.14 acres for $3,171,818.30, an average of $4.30 per acre. The company still has unsold 11,343,954.86 acres. The amount of the land notes on hand (interest not included) is $1,587,281.53. The total amount of land-grant bonds issued was $10,400,000, of which $1,323,000 have been canceled by the Land Department and $352,000 bought by the trustees, leaving the amount outstanding June 30, 1873, $8,725,000.

Chicago & Atlantic.

Articles of consolidation between the Chicago & Atlantic, the Chicago & Atlantic Extension and the Baltimore, Pittsburgh & Chicago Railroad Companies have been filed with the Secretary of the State at Indianapolis, Ind. The last named is the company which is now constructing the Baltimore & Ohio Company's line to Chicago. The object of the consolidated company is to build a direct line from Chicago to the eastern line of Ohio, there to connect with a line from that point to Pittsburgh. The capital stock is to be $4,000,000, and the general office is to be at Chicago. The office of the Indiana Division is at Huntington, Ind.

Junction City & Fort Kearney.

Kansas papers report that this company has been unable to obtain the funds needed for the extension of the road beyond Clay Center, Kan., and will consequently forfeit the $75,000 bonds voted by Clay County, on condition that the road should be completed to the north line of the county.

St. Louis & Great Southern.

The preliminary surveys of this projected road from St. Louis southward to Belmont and Hickman have been completed. The length of the road will be about 160 miles, and the engineer reports that a favorable line has been found.

—Chief Engineer Charles H. Baker, U. S. N., has been ordered to the Naval Academy at Annapolis as head of the Department of Steam Engineering.

Montgomery & Eufaula.

A circular has been issued to the holders of this company's bonds which states that negotiations are pending for a lease of the road, and that the Alabama Legislature has passed an act releasing the company from claims amounting to $400,000 due the State, on condition of the surrender of the State indorsement on the bonds. To accomplish this and enable the company to give a clear title to the lessee, bondholders are requested to surrender the bonds having the State indorsement, and to take therefor new bonds of the company secured by a first mortgage on its road, and other property. These bonds will bear 7 per cent. interest and have 30 years to run. They will be issued at once. It is stated that as there is no prospect of the payment, either by the State or the company, of the March or September coupons, it will be necessary to surrender the coupons with the bonds.

The road is 80 miles long, from Montgomery, Ala., southeast to Eufaula.

It is reported that the corporation which proposes to lease the road is the Louisville & Nashville Company. The bonds are at the rate of $16,000 per mile, we believe. Holders of more than half of their value have assented to the arrangement.

Utah Southern.

The iron for the extension of this road from its present terminus at Lehi, Utah, south to Provo, has been secured and is now on the way to Salt Lake.

Rahway & Roselle.

Surveys are being made for a railroad from Rahway, N. J., northward to the New Jersey Central at Roselle Station. This road would be about four miles long, and would make a line from Rahway to New York about the same length as by the Pennsylvania road.

Michigan Air Line.

A call for a special meeting of this company, to be held at Union City, Mich, August 27, has been issued by a number of stockholders. The object of the meeting is to remove the present board of directors and elect a new board, and to transact other necessary business having reference, it is supposed, to the pending litigation for the possession of the road.

Vicksburg & Nashville.

A large force is at work between Okolona and Grenada, Miss., and the work is being pushed forward.

Texas & Pacific.

A correspondent at Dallas, Tex., informs us that the iron has been laid to Grand Saline, Tex., 60 miles west of Longview and 14 miles beyond Minneola, the last point reported. On the western end the tracklayers have reached section 70, 53 miles east of Dallas, an extension of eighteen miles since the last report. A gap of only ten miles remains to be filled to complete the line from Shreveport to Dallas.

Iron for 20 miles of road has been delivered at Sherman, Tex., by the Missouri, Kansas & Texas road. Track-laying on the Trans-Continental Division will soon be commenced at Sherman.

Natchez, Jackson & Columbus.

The grading on this road is being pushed forward rapidly. Seven miles of track has been laid near Natchez, Miss.

Milwaukee & Northern.

The opening of this road for travel was celebrated, July 23, by an excursion from Green Bay, Wis., to Milwaukee.

Salt Lake City, Sevier Valley & Pioche.

The grading for this narrow-gauge road is now substantially completed and ready for the ties, from Salt Lake City to Millstone Point, 14 miles, and the delivery of the ties along the road has commenced. The bridge over Jordan river is completed. The contractors are Kimball & Rydalch, and Mr. T. Burgess is Chief Engineer.

Iron Mountain, Chester & Eastern.

This is the name of a company recently formed by the consolidation of the Chester & Tamaroa Company of Illinois and the Chester & Iron Mountain Company of Missouri. The agreement of consolidation has been ratified by the stockholders of both companies and the new company was organized at St. Louis, July 24. The Chester & Tamaroa road has been in operation about a year and extends from Tamaroa, Ill., on the Illinois Central, 85 miles north of Cairo, southwest to Chester on the Mississippi, and is 41 miles long. The Chester & Iron Mountain road is to extend from a point on the river opposite Chester, southwest to the Iron Mountain, a distance of 60 miles. About two-thirds of the grading on this road is done.

Valley, of Virginia.

Ground has been broken for the extension from Staunton, on the Chesapeake & Ohio, to Salem, on the Atlantic, Mississippi & Ohio. Work is to be commenced at once in Rockbridge, Botetourt and Roanoke counties.

Southern Pacific, of California.

The extension of the road southward from Tipton, Cal., has been completed to Elno, 24 miles from Tipton. Work on the extension has been stopped for the present, and it is thought that it will not go beyond Elno this season.

Manhattan & Northwestern.

This company has advertised for proposals for the grading of the road from Randolph, Kansas, north to a connection with the Central Branch, Union Pacific Railroad, a distance of 17 miles, work to be commenced immediately, and completed to south line of Riley County by the 15th of September, and to a connection with the Central Branch road by the 15th of October.

The grading is already completed, or nearly so, from Manhattan (which is on the Kansas Pacific 119 miles west of Kansas City) north to Randolph, 20 miles.

Martinsburg & Potomac.

A mortgage for $200,000 on this road has been recorded. The length of the road from Martinsburg, W. Va., to a connection with the Cumberland Valley road at the Potomac is about 12 miles.

Shenandoah Valley.

It has been decided to cross the Baltimore & Ohio near Duffield's on a bridge, instead of crossing at grade. The contract for the bridge across the Shenandoah River has been let to M. R. Donahue, and work is to be commenced at once. A number of the officers of the company recently visited Staunton, Va., to determine the point of junction with the Chesapeake & Ohio Railroad.

Jersey City & Albany.

The New Jersey section of this road (formerly the Ridgefield Park Railroad) was opened for travel by an excursion, July 30. This section extends from a junction with the New Jersey Midland near New Durham, N. J., north to the New York State line near Tappantown, a distance of 13 miles.

Northern Pacific—Pacific Division.

The exact location chosen for the terminus on Puget Sound is in township 21, range 3 east of Willamette Meridian. It is a little south of the present town of Tacoma and is at the head of deep water on Commencement Bay.

The grading on the extension north from Tenino is nearly completed to a point 14 miles north of the Nisqually River. Work on the grading has been temporarily suspended until the location of the line to the newly selected terminus can be completed.

St. Paul & Pacific.

In the suit against this company three of the defendents, the St. Paul & Pacific Company, First Division, George L. Becker and Horace Thompson, have filed affidavits to be used in opposition to the motion for a receiver. These affidavits set out in great detail the history of the road and deny that there was any unnecessary or avoidable delay in the arrangements for the loan of $15,000,000 for the construction of the St. Vincent and Brainerd extensions, as alleged in the application.

Kansas City, Memphis & Mobile.

A telegram announces that the legal complications which have delayed the construction of this road have been arranged and that work will be commenced at once. A good deal of grading was done on the line three or four years ago.

Nashua & Rochester.

The New Hampshire Legislature recently passed an act authorizing this company to issue $700,000 in bonds, provided these bonds were guaranteed by the Worcester & Nashua Railroad Company, which is to lease the road when completed. At a meeting held July 26, the stockholders of the Worcester & Nashua Company voted to guarantee the bonds as required.

Winona & St. Peter.

The track is laid for 27 miles west of the Minnesota State line, and trains are running to a point within 17 miles of Lake Kampeska, Dakota, which is said to be the terminus for this year.

Memphis & Raleigh.

Trains commenced running on this narrow-gauge road July 20. It is about 10 miles long, and is intended mainly for suburban and pleasure travel.

Milwaukee & St. Paul.

Recently this company began taking up the work that had been done for the wooden drawbridge across the mouth of Black River near La Crosse, Wis., and commenced preparations for building an iron bridge with stone piers across the river. It is also stated that the company put under contract the work for an iron bridge across the main channel of the Mississippi to Minnesota Island, which would make the greater part of the bridge across the Mississippi at the point desired by the company. On July 23, the United States District Attorney, by order of the Attorney General, applied to the United States Circuit Court for an injunction to restrain the Milwaukee & St. Paul Railway Company from the construction of a bridge across the Mississippi River at North La Crosse, the site being disapproved of by the Secretary of War, and which site also was disapproved by the Legislature of last winter.

An order was also asked for compelling the company to remove certain obstructions from the river, placed there for the avowed purpose of constructing a bridge in violation of the orders of the Secretary of War.

The Court issued an order summoning the company to appear July 29 and show cause why an injunction should not be granted. It is understood that other injunctions will be applied for by the steamboat men of the Mississippi and the lumber men of that river and its northern tributaries, and also by the city of La Crosse for diverting the course of the river.

Contracts.

The College Hill Tunnel Company, of No. 13 Market square, Providence, R. I., will receive proposals until August 20 for furnishing labor and material for the construction of a proposed tunnel through College Hill. The work will consist of earth and rock excavation, brickwork lining and rubble masonry retaining walls.

Lieutenant-Colonel John Newton, United States Engineers, will receive proposals for dredging Otter Creek, Vt., until noon of August 13, at his office, corner Houston and Greene streets, New York.

The New York Bridge Company will receive bids until noon of August 7 for the delivery at the Brooklyn anchorage of the East River Bridge of 125 cubic yards of cut granite face stone, and 8,850 cubic yards of face stone and backing, either granite or face stone, to be delivered within the current year.

[CONTINUED ON PAGE 315.]

RAILROAD GAZETTE

Published Every Saturday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

CONTENTS.

Editorial Announcements.

Removals.—The Chicago office of the RAILROAD GAZETTE *has been removed to No. 77 Jackson street, opposite Third avenue.*

The New York office of the RAILROAD GAZETTE *is removed to Room 131, No. 73 Broadway, opposite the upper elevator landing.*

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

TRAIN WRECKING.

Train wreckers have been unusually active for the past week or two. The great case, of course, is the attack of highway robbers on the Chicago, Rock Island & Pacific train near Adair, which was unlike ordinary cases in that it was bold and open, and also in the means employed to wreck the train, which was to unfasten a rail, leave it in the track with no visible obstruction, but with a rope attached to one end, by which a man concealed could pull it out in a moment when the train should be almost on the rail. In this case the robbers were a little too quick, else they would not have given the engineman time to shut off steam and put on brakes. This is the most dangerous feature of the crime, for it may be imitated with terrible results. We have noted before that only a very small proportion of the attempts to wreck trains are successful. Usually the watchfulness of the engineman or of trackmen discovers the obstruction in time to stop before it is struck. But with such a fiendish contrivance no defect is visible, and no fatal one may exist, until the very moment when the wrecker chooses, which would be, doubtless, when the engine is within a few yards of the rail. Fortunately, however, the criminal must be near by to carry out his design, and this doubtless will prevent its adoption by the ordinary wrecker, who is almost always a sneak, and adopts train-wrecking rather than highway robbery, murder, or even picking pockets, because usually he may do his deed secretly, and be distant when the crime is completed.

But the probable consequences are fearful to contemplate should a man be found bold enough to wait for the approach of a train, and to pull the track out from under the locomotive almost, as well as cunning enough to choose a bridge or embankment where accident must almost surely be terribly fatal, and malicious enough to desire the destruction of men, women and children; and the cunning and malice, we know, do not fail them.

The one encouraging thing about the Iowa outrage is the earnestness and vigor with which the criminals have been pursued, and the co-operation of different railroad companies and the authorities in efforts to bring the villains to justice. As we write, no tidings of their capture has been received; but the close pursuit in itself is something of a punishment, though lacking several halters of being enough, of course. It is very much to be hoped that the ruffians will be caught, for the peculiar circumstances which have made it famous and awakened such indignation make it probable that they would receive adequate punishment; and these same circumstances would make the punishment known and remembered, and so probably have a wider and greater deterring effect than punishments in most similar cases, which are not widely known, not much talked of, and probably not generally remembered.

Some months ago we collected a long list of attempts, successful or otherwise, to wreck trains, and urged the general co-operation of railroad companies in urgent and unceasing efforts to detect and secure the offenders. And we believe that if something like the same energy was exerted in the ordinary (alas! that we can say "ordinary") cases as in this extraordinary Iowa case, instances of malicious train-wrecking would become very rare. And in this case, should the pursuers fail to find the robbers "in Jackson County," or elsewhere, we hope that the efforts to find them will not be given over, but persisted in so long as a trace remains and whenever one appears. It can hardly be a pleasant thing for a ruffian to know that all the power and wealth of a railroad company—or, better still, of the co-operated railroad companies—will be on his track until he is caught or dead; and a knowledge that this would be the case would have a greater deterring effect than the severest penalties enforced no more certainly than they usually are in these cases.

That circumstances may have much to do with the measure of popular indignation and the urgency of pursuit of train-wreckers is shown by another recent case. In this the engine-man of a mail train on the Ohio & Mississippi Railway discovered a pile of burning rails on the track in front, near North Vernon, Ind., and, on stopping, a man concealed behind a fence fired several shots into the train. The conductor and some passengers chased and caught this man, who proved to be a farmer living near by, who claimed that he had had fences burned by sparks from locomotives, and confessed that he had acted in revenge. This man was brought before a magistrate and—dismissed on giving $500 bail!

American Bonds in Germany.

A Frankfort journal, the *Deutsch-Amerikanische Oeconomist*, gives a table showing the prices of various securities in that market at the beginning and middle of each month for the year 1872 and the first half of 1873. From it we see that New York city currency 7's fluctuated from 98¼ February 1, 1872, to 93¾ June 16, 1873; Washington city 6's from 94 February 1, 1872, to 80 July 1, 1873; Alabama & Chattanooga 8's from 69½ May 1, 1872, to 35 July 1, 1873; California Pacific 6's from 100⅓ February 16, 1872; to 92½ December 16, 1872, the last quotation being 92¾; Central Pacific 6's from 90⅝ January 16, 1872, to 80⅝ June 16, 1873, closing at 83⅝; Kansas Pacific 7's from 88¼ January 16, 1872, to 75½ June 3, 1873, closing at 76; South Pacific 6's from 78½ February 1, 1872, to 58 May 16, 1872, closing at 60¼; Oregon & California 7's from 75⅞ January 16, 1872, to 22½ July 1, 1873; Rockford, Rock Island & St. Louis 7's from 45 February 1, 1872, to 28 June 3, 1873, closing at 29; Union Pacific "Omaha Bridge" 8's from 94 February 1, 1872, to 79⅜ June 16, 1873, closing at 80½.

These are given as the securities most commonly dealt in in the Frankfort market. The course of the market is very clearly downwards, especially with railroad securities, and is a sufficient explanation of the disfavor with which new American railroad enterprises are met in the German market. We see that the fluctuations in railroad bonds have varied from 7⅝ points on California Pacific to 53½ on Oregon and California, while New York City fell but 4½, and United States 6's, of 1882 closed ⅝ higher than they opened, and their greatest fluctuation was but 1½. In the whole list there are but two securities—California Pacific and Central Pacific—whose depreciation from January 16, 1872, to July 1, 1873, was not greater than the interest received for the year and a half, so that those Germans who bought these securities at the former date would have had more money now if they had buried their money, or otherwise held it without interest; and these two paid only 2⅝ and 1⅞ more than the depreciation in the year and a half.

We by no means assert that there has been reason for the depreciation in all these cases: doubtless the failures of a few poor properties have affected the values of the perfectly sound ones, and some at least of the securities named ought to be good investments at the current prices. But the fact remains that prices have fallen, and that almost constantly, for the year and a half; and that those Germans who bought American railroad bonds a year or more ago have lost money by the operation. It is useless to tell them (those who bought good bonds) that they have received an excellent interest on their investments and will get the principal of the bonds in full when due, for they will reply that they might have taken the interest out of the amount of capital they invested and still have money enough left now to buy more bonds than they have got.

It may be objected, also, that these securities have not been well selected and are poorer than the average; and that it is not fair to judge American railroad securities as a whole by a poorly selected lot. But the Frankfort paper speaks of these securities as those most commonly dealt in there, and it is natural that Germans should form their judgment from their own peculiar experience. It is much to be hoped, for the sake of America as well as Germany, that they may invest more judiciously hereafter. Twenty or thirty solid properties paying regularly 7 per cent. interest on bonds sold at par or nearly so would give us good credit again in Germany, which would be of great value to the nation and could not be destroyed, though it might be disturbed, by the failure of enterprises without sufficient foundation, which will always be ready to take all the money they can get in all the money markets, and have very poor chances to get any at home.

The bottom seems to have been reached from the 1st to the middle of June, and since that time there has been a rise in most of the securities whose interest is paid; but too little time has elapsed as yet to judge whether the market has really turned. Really, if these securities are as sound as they are usually considered, now would seem an excellent time for German investors to buy them.

Railroad Earnings for the First Half Year of 1873.

The tables which we publish this week give the earnings of twenty-five railroads for the month of June, and of twenty-two for the half year ending with that month. Returns are given from some roads which do not report regularly nor frequently. For the month the report is very favorable, for with an increase of less that 5 per cent. in mileage we have an increase of 14¼ per cent. in earnings, and the increase in receipts per mile is 9¼ per cent. Five roads show a decrease, which in most cases is quite small, the largest being 7½ per cent. While the largest increases are on new roads with receipts still light, there are some large ones on lines with comparatively large traffic, the Chicago & Northwestern, the Columbus & Hocking Valley, the Michigan Central, all of which have receipts above the average, having increased more than 20 per cent., and the Lake Shore & Michigan Southern nearly as much.

The statement for the half-year, however, is of more importance. It is the poor half of the year for most railroads; but it has not been much affected by untoward circumstances, such as strikes, unless we count as such the low price of grain, which may have kept back shipments, as it has kept down rates, though the unusually large bulk to be moved has probably made up for that. Of the twenty-two lines whose receipts we give for the six months, only three show a decrease in gross receipts, and these decreases altogether are very small; but many of these are working an increased mileage, and eight show a decrease in receipts per mile. The largest of these are the Indianapolis, Bloomington & Western (which has a large new mileage on which traffic is but just begun), 11¼ per cent.; Pacific of Missouri, 13 per cent., and St. Louis & Iron Mountain, 13⅝ per cent. The percentages of increase vary from 23 to ⅛ per cent., and average 4 1/16, or $183 per mile. The mileage reporting is 14,292, which is probably one-fifth of the mileage now worked. Only two lines east of Buffalo report. Two of the leading lines from Chicago eastward report increases of 3½ and 12⅝. Four of the roads which carry grain to Chicago report increases of 2¾, 6⅝, 3⅞ and 12½ per cent. Four of the lines which cross Illinois south of Chicago, and to a greater or lesser extent divert grain from that city, report, two showing decreases and two increases, the latter being the most southerly lines, which are never much affected by lake transportation. Of the lines to St. Louis west of the Mississippi, one shows an increase and three a decrease. Only one Southern line, the Mobile & Ohio, reports, and it shows an increase which last year's good cotton crops ought to have made general on Southern roads, their traffic depending very largely on this crop and the price obtained for it.

The average earnings per mile for the half year has been $4,692; and as the last half of the year is much the best for traffic, it is reasonable to suppose that the average earnings of these roads for the year will be about $10,000 per mile. Deducting 65 per cent. for working expenses,

RAILROAD EARNINGS FOR JUNE, 1873.

Name of Road.	Mileage. 1873.	Mileage. 1872.	Increase. Miles.	Increase. P. c.	Earnings. 1873.	Earnings. 1872.	Inc.	Dec.	Per cent.	Earnings per mile. 1873.	Earnings per mile. 1872.
Atlantic & Great Western	539	539	.....	.....	$423,514	$435,501	.....	$11,987	2¾	$786	$808
Atlantic & Pacific	328	328	.....	.....	98,8 0	96,567	$2 233	.....	2¼	301	294
Baltimore & Ohio	917	873	44	5	1,323 797	1,211,942	111,855	.....	9¼	1.444	1,388
Burlington, Cedar Rapids & Minnesota	334	261	73	28	96,696	74,242	22.454	.....	30¼	289	285
Central Pacific	1,218	1,094	124	11⅓	1,313,79	1,138,272	175,518	.....	15⅓	1,071	1.010
Chicago & Alton	149	623	26	4⅓	482,205	419,197	63,108	.....	15	743	657
Chicago & Northwestern	1,404	1,353	51	3¾	1,292 143	1,070,460	221.683	.....	20¾	92	791
Columbus & Hocking Valley	89	89	.....	.....	75.510	62.001	13.509	.....	21¾	848	697
Erie	971	964	7	0¾	1,717.593	1,607,492	110,101	.....	6⅞	1 769	1,668
Illinois Central	1,109	1,109	.....	.....	724.983	659 363	65 620	.....	9⅞	651	595
Indianapolis, Bloomington & Western	344	212	132	61¼	136.178	100,868	35.310	.....	35	396	476
Kansas Pacific	672	672	.....	.....	312.014	315,363	.....	2,749	0⅞	465	469
Lake Shore & Michigan Southern	1,136	1.045	91	8¾	1,583,368	1,323,476	261,892	.....	19¾	1,396	1 266
Marietta & Cincinnati	284	284	.....	.....	185,953	154,587	31,366	.....	20¼	655	544
Milwaukee & St. Paul	1,236	1,121	115	10¼	929,210	594.768	334,442	.....	56¼	752	531
Michigan Central	715	715	.....	.....	608.955	5 5 314	103.641	.....	20½	852	707
Ohio & Mississippi	393	393	.....	.....	282 3 2	262.326	19.976	.....	7⅝	718	667
Pacific, of Missouri	471	471	.....	.....	272,600	286,738	.....	14,138	5	579	609
St. Louis, Alton & Terre Haute, Main Line.	266	266	.....	.....	116 365	94.535	21.830	.....	23⅛	437	355
" " " Branches..	71	71	.....	.....	48.895	35.545	13 350	.....	37⅝	689	501
St. Louis & Iron Mountain	285	224	61	27¼	195.480	180 787	14.693	.....	8⅛	686	807
St. Louis, Kansas City & Northern	583	583	.....	.....	199.958	216.324	.....	16,396	7½	343	371
St. Louis & Southeastern	349	349	.....	.....	119.020	82.664	36,356	.....	44	341	237
Toledo, Wabash & Western	628	628	.....	.....	511.192	432,868	78.324	.....	16⅞	862	737
Toledo, Peoria & Warsaw	237	237	.....	.....	114 601	94.522	20 079	.....	21¼	484	399
Mobile & Ohio	517	517	.....	.....	148,691	151,945	.....	3 254	2⅛	288	294
Total	15,745	15,021	734	4⅞	$13,346,413	$11,637,697	$1.757 240	$48 524	...	$848	$775
Total increase	.....	.....	.....	.....	.....	.....	1,708,716	.....	14⅝	.....	.....

RAILROAD EARNINGS, SIX MONTHS ENDING JUNE 30.

Name of Road.	Mileage. 1873.	Mileage. 1872.	Increase. Miles	Increase. P.c.	Earnings. 1873.	Earnings. 1872.	Increase.	Decrease.	Per cent.	Earnings per Mile. 1873.	1872.	Inc.	Dec.	P.c.
Atlantic & Great Western	539	512	27	5¼	$2,442,605	$2,333,721	$108,884	.....	4⅝	$4,532	$4,558	....	$26	0⅝
Atlantic & Pacific	328	328	.....	...	613.320	514,189	99,131	.....	19¼	1,870	1,568	$302	.....	19¼
Burlington, Cedar Rap. & Minn	334	261	73	28	482 035	409 964	72 071	.....	17⅝	1.443	1.571	....	128	8⅓
Central, of New Jersey	291	291	.....	....	4,135,012	3 455,957	679,055	..	19⅝	14.210	11.876	2,334	.....	19⅝
Central Pacific	1,218	1,094	124	11⅓	6,320.787	5,508.616	812.171	.....	14¾	5.189	5.035	154	.....	3
Chicago & Alton	649	613	36	5⅞	2,485 311	2.281,156	204,155	.....	9	3 829	3.721	108	.....	2⅞
Chicago & Northwestern	1,397	1.336	61	4½	5,997.670	5.380.987	616,683	.....	11½	4,293	4.028	265	... ..	6⅝
Erie	971	959	12	1¼	9 176.007	8,995 046	180,961	.....	2	9,450	9.380	70	.....	0¾
Illinois Central	1.109	1,109	.....	.....	3,752 048	3,612,637	139.411	.....	3⅞	3.383	3,258	125	.....	3⅞
Indianap., Bloomington & W'tn	256	212	44	20⅞	697.318	651.342	45,976	.....	7⅛	2.724	3.072	.....	348	11¼
Kansas Pacific	672	672	.....	.....	1,620.747	1.651.754	.....	$1,007	0⅛	2,456	2,458	.....	2	0⅛
Lake Shore & Mich. Southern.	1,136	1,012	124	12¼	9,833 856	8,464.178	1,369.678	.....	16⅛	8.657	8,364	293	.....	3½
Marietta & Cincinnati	284	284	.....	.....	1,075,273	904,931	170 342	.....	18⅞	3,786	3.186	600	.....	18⅞
Michigan Central	715	715	.....	..	3,672,050	3 261,776	410.274	.....	12⅝	5,136	4.562	574	.....	12⅝
Ohio & Mississippi	393	393	.....	...	1.823,758	1,617,473	206.280	.....	12¾	4.641	4,115	526	.....	12¾
Pacific, of Missouri	471	394	77	19½	1,729,043	1,663.47.	65,573	.....	3¾	3.671	4.222	....	551	13
St.L.,Alt.&Terre H'te,main line	266	266	.....	....	694,511	668 687	29,824	.....	4½	2,626	2.514	112	.....	4⅓
" " " branches	71	71	... ..	....	295,876	240,402	55,474	.....	23	4,167	3,386	781	....	23
St. Louis & Iron Mountain.. ..	285	224	61	27¼	1,164.461	1.059.133	105 327	.....	10	4,086	4,728	....	642	13⅝
St. Louis, Kan.City & Northern	583	583	.....	....	1.299.987	1.374,184	.....	83.197	6⅛	2,214	2.357	....	143	6⅛
Toledo, Wabash & Western	628	628	.....	....	2,705,018	2,753,346	.....	48,328	1¾	4,307	4,384	....	77	1¾
Mobile & Ohio	517	517	.....	....	1,398.556	1.331.226	67.330	.....	5⅛	2.705	2.575	130	.....	5⅛
Milwaukee & St. Paul	1,179	1,069	110	10¼	3.617,681	2,924,162	693,519	.....	23¾	3,068	2,735	333	.....	12⅛
Total	14,292	13,548	749	5½	$67,057,924	$61,058,337	$6.132.119	$132,532	.....	$4,692	$4,509	$18	.....	4⅛
Total increase	.....	.....	.....	.....	.....	.....	5,999 587	.....	9¾	.....	.....	.....	.....	.....

we have $3,500 per mile, which is probably enough to pay 7 or 8 per cent. on the average actual cost of the roads reporting, only one of which has a double track throughout, and only two any large amount of double track.

The Pass Reform.

So far the abolition of free passes has proved a popular movement, and the good work goes bravely on and has met, we believe, no noteworthy drawback. Trouble was most to be feared from the failure of all parties to agree to give up the practice of giving passes in consideration of shipments of live stock; a practice which has been almost universal, and which in most cases was actually a rebate on freight paid in passenger fares. But the Chicago & Alton and other companies which at first could not see their way clear to abandon this practice, in view of their competition for cattle traffic with railroads which were not parties to the Chicago agreement, have announced that they have given it up, and reports of violations of the agreement by other roads turn out to be erroneous.

But more encouraging than the month's persistence of the Chicago railroads in their new and good resolutions is the adherence of all (or nearly all) the companies having termini at St. Louis and several others west of the Mississippi to a similar policy, which was to go into force on the 1st of August. The names of these companies will be found in a brief report of the meeting on another page.

So far the movement seems to have spread westward and southward, largely among roads which pay no dividends. But a Cleveland newspaper says that the new President of the Lake Shore & Michigan Southern has forbidden the issue of any more passes on that road—an order which will be welcomed by no one so much as the leading officers who work the road. This brings the reform well to the eastward, and upon a line which is one of the chief competitors for that through traffic which the "judicious use" of free passes was supposed to do so much to cultivate. We wish we could say that the other two lines from Chicago eastward would adopt the same policy; but if they do not we will have a pretty good opportunity to see what the effect of the abolition of the practice will be. It has been reported, however, that Mr. McCullough, the General Manager of the Pennsylvania Company's leased lines, says that if the Western companies maintain the policy, the Eastern roads will be ready to adopt it by next January; and, indeed, should they demonstrate, as seems probable, that the only real obstacle to the reform is the lack of courage to order it, it will not be easy to understand why it should not become general throughout the country. Its final success we believe to be inevitable, however the present movement may turn out; but its early success is desirable, and there seems now to be good reason to hope that the granting of passes may become an antiquated practice before this summer's babies can talk plainly.

The Late Samuel B. Cushing.

Mr. Samuel B. Cushing, a distinguished civil engineer of Providence, R. I., was found dead in his bed on the morning of the 17th of July, having passed away peacefully as in sleep from an affection of the heart of long standing.

Mr. Cushing was born in Providence in February, 1811. At the age of 16 he began the study of his profession under Mr. Holmes Hutchinson, Chief Engineer of the Blackstone Canal, then in process of construction, remaining upon that work until its completion. After this he was engaged in various minor works until the year 1830, when he opened an office in his native place, carrying on a general engineering business for two or three years, during which time he ran out the boundary line between Rhode Island and Massachusetts and made the principal surveys for a map of Rhode Island. About the year 1833 he removed to Illinois, intending to make a home for himself in what was then considered the far West. In 1843, however, he received an earnest invitation from Mr. Edward Harris and other prominent business men of Rhode Island to return to the scenes of his early life for the especial purpose of apportioning the ownership of the waters of the Blackstone River, his well-known experience in that particular rendering him better qualified to perform this delicate duty than any other man in the State. In accordance with this request he came back to Providence, and performed the work required of him to the entire satisfaction of all parties concerned, and then took up his residence permanently in the place of his birth.

He was Division Engineer in charge of the eastern portion of the Hartford, Providence & Fishkill Railroad till its completion.

The granite bridge over the Blackstone River at Pawtucket, and the Railroad bridge at India Point, Providence, were erected by him, as also the bridge over the Connecticut River at Lynn, and the Central bridge over the Seekonk River at Providence. Almost his last piece of work was the supervision of the renewal of the original drawbridge at Point street, Providence, and the erection of the present one; in the performance of which duty he manifested, as was his wont, the qualities of an upright judge in guarding with equal care the rights of his employers and of the contractor who carried out his general designs. He was the inventor of a method of constructing bridge piers, by a system of timber piles, surrounded by cast-iron cylinders, the intervening spaces being filled with concrete. This plan of pier has been successfully used in several cases, among which are the piers of the Tensas Railroad bridge near Mobile, and the Shore Line bridge over the Connecticut River.

As an hydraulic engineer Mr. Cushing stood among the first in his profession. His well-known integrity of purpose and extensive experience in the management of water-power caused him to be selected on several occasions as umpire in important controversies involving the rights of owners, notably the Aston and Albian case, and the Pawtucket case, his decisions being invariably accepted as satisfactory.

The disease of which he died was an affection of the heart. He had been unwell for two weeks previous to his death, but his symptoms were not considered alarming; in fact, on the afternoon of Wednesday he appeared to be in better spirits than at any preceding time during his sickness; but upon entering his room the next morning he was found peacefully sleeping his last, without a sign of pain upon his serene features.

His family have the assurance of the heartfelt sympathy of the community in which he lived, and the profession of which he was so exemplary a member can point with pride to the record which his works have left behind him as an earnest of what may be accomplished by a steadfast attention to duty and an uncompromising adherence to the truth.

Record of New Railroad Construction.

This number of the Railroad Gazette has information of the laying of track on new railroads as follows:

Jersey City & Albany.—Extended from Schraalenburg, N. J., north 6 miles to the New York State line near Tappantown. *Memphis & Raleigh.*—This road (of 3 feet gauge) is completed from Memphis northeast 10 miles to Raleigh, Tenn. *Natchez, Jackson & Columbus.*—Track (of 3 feet 6 inches gauge) is laid from Natchez, Miss., northeastward 7 miles. *Texas & Pacific.*—Extended from Minneola west 14 miles to Grand Saline, and on the western section from Terrell east 18 miles, in all 32 miles. *Southern Pacific, of California.*—Extended from Tipton southward 24 miles to Elno, Cal. *Winona & St. Peter.*—Extended from the line between Minnesota and Dakota westward 27 miles. *Northwestern Union.*—Completed from Milwaukee to Fond du Lac, by the laying of track from Germantown northwest 12 miles to West Bend, Wisconsin.

This is a total of 118 miles of new railroad.

California Wheat has suddenly become a most important export, and it doubtless affects considerably the wheat market of the Northwest. The exports from San Francisco for the year ending with June last were 16,400,000 bushels, which is more than double the exports of any previous year, and seven times those of the preceding year. The crop of the present season is reckoned to be about as large as last year's. The effect of this grain on the market is the greater from the fact that nearly every bushel goes to Europe, which is almost the only possible market for California wheat, Asia not being a wheat consumer, and the freight to the consuming districts of the Northeast United States making that market an unprofitable one to the Pacific coast (the grain goes around the Horn in sailing vessels), and the lack of population on that coast giving but a trifling home demand. Thus, with a wheat product hardly more than a fifteenth of the annual consumption of the United States, California affords perhaps half of our wheat exports. The great market of the Upper Mississippi Valley is in the Northeast United States, and only its secondary market in Europe. An increase in the California production at the rate of the past ten years for ten years to come would make it the great source of supply for Europe, and probably limit the more eastern States to a home market almost entirely.

The wheat receipts at San Francisco in the year ending with June last were equivalent to 53,624 car-loads, the flour receipts making 2,228 car-loads more.

Three Years Imprisonment has been fixed upon in St. Louis as the proper punishment of a deliberate attempt to wreck an excursion train. This victim of oppression had been put off the train and tried to show a becoming resentment by piling some ties upon the track where a high bluff on one side of the track and a stream on the other gave good promise of a very successful accident. He was caught in the act, and as there must have been trees and bridges of some height near by and a bell-cord on the train, it is not quite easy to understand how the high-spirited young man was not protected against delivery to the minions of the law and three years' retirement from usefulness. He plead guilty at his trial, and perhaps that had something to do with his absurdly insufficient punishment. A man who attempts to murder one person being punishable with two years imprisonment, say, we suggest that he whose attempt is on a train load of persons should be imprisoned two *n* years—*n* being the number of persons on the train. But as he cannot be expected to know just how full the cars are, perhaps *n* should cover the seating capacity rather than actual inmates of the train. This would insure from 50 to 400 years as the term of imprisonment, which is about enough—if it must be imprisonment.

The Mexican Railway Company, which owns and works the line between Vera Cruz and Mexico completed last year, at its recent annual meeting reported that the earnings of the section between Mexico and Puebla, 40 miles, which had been in operation throughout the year, were at the rate of £1,249 gross and £532 net per mile in 1872, while on the 70 miles of the Vera Cruz line open throughout the year the earnings were £1,063

gross and £81 net per mile. From the opening of the line throughout to the end of April the gross earnings were at the rate of about £26 per week. This, with moderate working expenses, would pay a fair income to a road not more costly than an average American line; but the Mexican & Vera Cruz line is an exceedingly costly one. The Government is to pay it £25,000 a year, however, and the contractor prophecies an "ultimate" traffic of £80 per week, for which, we imagine, he will have to wait until the proposed interior system of railroads is constructed. With that, such earnings would not be at all extravagant.

"TRUE HEROISM" is an epithet we find attached to a country constable in a short account of the act of one Mr. Stephen Chase, who, riding ac oss the track of the Grand Rapids & Indiana Railroad in the woods near Fort Wayne, Ind., found a large tree lying across the track, having been blown down. Knowing that a passenger train would be due in about two hours, he procured an ax, and went to work on the tree, intending to cut out a section and roll it off the road. This was proper and commendable, but hardly heroic. The heroism began when, having cut off one end, the ax slipped and cut his foot—"half off," the report says—and the brave man mounted the other end, shut his teeth hard, cut the log into two, and rolled it clear from the track; when he rode home to take care of his foot. Its a very pretty subject for a poem or a painting, whether it's true or not.

MR. WASHINGTON ROEBLING'S LETTER which, two week's ago, we said we had received and would publish the next week, proved, on examination, to be a copy of that addressed to *Engineering*, which we published two weeks ago.

AMONG THE SHOPS.

THE LAKE SHORE & MICHIGAN SOUTHERN RAILROAD SHOPS AT ELKHART.

This road consists of a single line from Chicago to Elkhart, a distance of 101 miles. At the latter place it branches, one portion—the "old road"—extending northward into the southern portion of Michigan; the other—the "air line"—running southward through Indiana and Ohio, and both terminating at Toledo. The distance from Elkhart to Toledo by the "old road" is 113, and by the "air line" 133 miles. Elkhart is, therefore, centrally located at the junction of three sections of the road, each of a convenient length, to operate with one set of engines, and, therefore, an excellent position for the repair shops of the locomotive department. It was this very obvious fact which, doubtless, led the company a few years ago to select this place for the new shops, which have since been completed and which we will now describe.

The main building, at first sight, appears to be a low structure, 600 feet long by 120 wide, with a roof nearly flat. From the inside, however, it appears of ample height, being 22 feet to the eaves. The roof is supported on two rows of iron columns, arranged somewhat as those in the Reading car shops, which we described a few weeks ago. They divide the roof into three spans, each carried by a queen-post truss, the top chord of which is made of two wrought-iron channel bars; the posts of cast iron, and the tension members of square rods of wrought iron. The purlins are made of I beams trussed, and the outside of the roof is covered with gravel. A skylight extends the whole length of the shop, in the center of the roof. The sashes of this light are placed in inclined positions, resembling an inverted Λ. Their angle is sufficiently steep to shed rain, and to cause little difficulty from leakage.

The floor is divided into three parts by the cast-iron columns. The one on the north side is occupied by the lathes and other tools and machines. Through the center lengthwise of the shop is a track which permits cars or engines to be run to any desired position. This gives every facility for the transfer of materials of all kinds to any position where they may be needed. The south division is occupied by transverse tracks with pits in which engines are built and repaired. On the outside, and about 40 feet from the main building, is a transfer table, by which engines or cars can be moved to and from any track in the shop. Locating it so far from the building gives an advantage, as it allows room enough between the transfer pit and the shop to permit engines to be run out of the shop to be fired up, or for other purposes, without using or interfering with the use of the table. Often it is desirable to do this, in testing boilers for example, and then run them back into the shop again.

The following complete list of machine tools may be useful in showing what is required for the equipment of such a shop:

LIST OF TOOLS,	MAKERS.
1 lathe, 36 inch swing by 15 feet bed	Lowell Machine Shop.
1 " 22 " 10 "	Fitchb'g Machine Co.
1 " 24 " 12 "	Putnam Machine Co.
1 " 20 " 10 "	Dw. lley & Co.
1 " 24 " 14 "	Putnam Machine Co.
1 " 23 " 12 "	L. B. Tyng.
1 " 16 " 8 "	Putnam Machine Co.
1 " 16 " 8 "	" "
1 " 36 " 16 "	" "
1 " 7 " 18 "	Jackson State Prison.
1 " 16 " 6½ "	Putnam Machine Co.
1 " 20 " 10 "	" "
1 " 26 " 12 "	Wright & Smith.
1 " 28 " 10 "	Mattepan Iron Co.
1 " 22 " 10 "	Dwelley.
1 " 30 " 16 "	Putnam Machine Co.
1 " 33 " 13 "	Lowell Machine Shop.
1 " 12 " 14 "	Putnam Machine Co.
1 " 24 " 12 "	" "
1 " 24 " 14 "	" "
1 " 28 " 12 "	Mattepan Iron Co.
1 " 16 " 8½ "	P. C. Curtis.
1 " 26 " 11 "	Thayer & Haughton.
1 " 25 " 14 "	Putnam Machine Co.
1 " 24 " 14 "	" "
1 " 30 " 16 "	" "
1 " 40 " 30 "	
1 " 14 " 7½ "	— Fox.
1 " 18 " 6 "	Dwelley.
1 " 14 " 5 "	
1 axle lathe, 14 in. swing by 13 ft. long	W. B. Bement & Son.
1 double-headed wheel lathe	Bement & Dougherty.
1 14 inch compound planer	" "
1 screw planer, 20 in. wide by 10½ ft. bed	Lowell Machine Co.
1 " 20 in. wide by 6½ ft. bed	Ames Manufac. Co.
1 planer, 5 ft. wide by 21 ft. bed	Wm. Sellers & Co.
1 " 3 ft. wide by 16 ft. bed	" "
1 " 4 ft. wide by 18 ft. bed	Bement & Dougherty.
1 gear planer, 30 in. wide by 7½ ft. bed	Thayer & Haughton.
1 compound planer, 14 in. wide by ft. bed	Bement & Dougherty.
1 screw planer, 30 in. wide by 5½ ft. bed	Lowell Machine Co.
1 double-headed connecting-rod planer	Wm. Sellers & Co.
1 16 inch double headed compound planer	W. B. Bement & Son.
1 36 inch drill press	
1 48-inch "	Putnam Machine Co.
1 48-inch "	
1 48 inch "	Clute Bros.
1 44 inch "	Putnam Machine Co.
1 40-inch "	Gay & Silver.
1 40 inch "	Bement & Dougherty.
1 50-inch "	" "
1 bolt cutter	
1 "	A. C. Powell.
1 "	Wm. Sellers & Co.
1 40-inch slotting machine	Lowell Machine Shop.
1 cylinder boring mill	
1 hand lathe	
1 shear and punch	
1 car wheel press	
1 " boring mill	W. B. Bement & Son.
1 20-inch boring mill	Gay & Silver.
1 7-foot boring mill	Bement & Dougherty.
1 driving-wheel quartering machine	" "
1 200-ton hydraul.c wheel press	" "

The power for these tools is furnished by a double-cylinder vertical Corliss engine, which is connected directly to the main line of shafting by two cranks in the center, thus dispensing with the "main" belts. The engine is located about the center of the shafts, so as to transfer the power each way on the main shaft. The cylinders are 14x36 inches. Steam is supplied by two larger boilers of the locomotive type. The counter shafts are hung to a longitudinal bridge, which extends almost the whole length of the shop, and affords easy access to the shafting for making repairs, oiling, etc. One bridge is suspended from the roof trusses by cast-iron brackets.

There is nothing very noteworthy in the work which is being done now. Nearly all the force is employed on the ordinary repairs of engines. The only new work in progress is that on several tank engines for switching. These are of the ordinary four-wheeled form, with a tank on top. These engines are liked better than any others for the service for which they are intended.

BOILER SHOP.

On the north side of the main building are three wings, one near each end, and another about the middle. These are each about 70x100 feet. The one farthest east is occupied as a boiler shop, and has a power shear and punch, a set of large bending rolls for boiler plate, drill press and a few other minor tools. The shop is large and roomy, and some of the work, especially the tanks for the switching engines, is equal to the best we have ever seen.

BLACKSMITH SHOP.

This is in the center wing, and has 17 fires in all, with two steam hammers, one built by Bement and the other by Ferris & Miles. The ventilation of this shop is very well arranged. The roof is built with a sort of clere story, lengthwise of which a large horizontal sheet-iron pipe extends. To this all the fires are connected by smaller pipes. In the center of the roof is a sort of tower, through which a branch of the large pipe is carried vertically, thus allowing the smoke to escape. The effect of this arrangement is that the air in the clere story is heated, thus giving it a tendency to rise and escape by openings in the roof and the tower already referred to. Attempts to ventilate shops are often unsuccessful because those who design the arrangements lose sight of the fact that air must be heated before it will rise or a current can be created. Many a smoky engine-house could doubtless be kept clear of smoke if a steam-pipe was run around the dome so as to heat the air and thus give it an ascending current.

GRINDING ROOM.

Near the blacksmith shop a new grinding room for doing polishing work has has just been fitted up. We noticed no provision for exhausting the air and dust from the grindstones and emery wheels, an omission which, for sanitary reasons, should never be neglected; but, we regret to say, generally is.

WASH ROOM.

The wash rooms and water-closets are worthy of notice. The former are provided with 62 fixed basins with hot and cold water. They are set in a soapstone slab, and give every facility which could be desired after the day's work is done. The water-closets, too, instead of being places of abomination, breeding disease and pestilence, are more comfortable and cleaner than those found in many "good" hotels.

STORE ROOM.

A large store and tool room is conveniently located for the men. It is not very unlike similar rooms in other shops, excepting for the orderly manner in which it is kept, which is perhaps not remarkable when we learn that it is in charge of a lady.

CARPENTER SHOP.

This is in the west wing of the main building. It is provided with two wood-turning lathes, two cross-cut circular saws, two slitting saws, two jig saws, one matcher and planer, and one surfacing planer. The work on tenders, cabs, cow-catchers, patterns, etc., is done here.

About 150 feet north of this shop is a wooden building about 60x100 feet, used by carpenters and others for doing all kinds of cabinet work for stations, offices, etc., hand cars, pumps for water stations, etc. It is supplied with wood and iron turning lathes, drill presses, etc.

LUMBER YARD.

Still farther north of this building is the lumber yard, where timber of different kinds is piled up and stored to be seasoned and kept in readiness for use.

FOUNDRY.

The building used for this purpose is, like the main shops, built of brick, and is located southwest of the main shops. It is about 20x60 feet and has four cupolas. All castings for the road west of Toledo are made here, including car wheels. For the floor work there are three large swing cranes. The wheel work is done on the same system as that used in Whitney & Sons' foundry in Philadelphia. The flasks are placed in two rows between and one on each side of the track, which is of 9 feet 9 inches gauge. On this track two cars or rather movable cranes run, mounted on wheels four feet in diameter, which give height enough to allow the car or crane to run over the tops of the flasks. The metal is handled by these cranes, which can be swung round so as to reach each row of flasks, and is moved backward and forward by a capstan or wheel on the car, so that the metal can be poured from one of these cranes into any of the flasks. These cranes were built by Wm. Sellers & Co., of Philadelphia.

The cupolas are charged by an elevator, which is worked by a worm-wheel and drum with clogs, and a rack to catch it in case of accidents.

About 32 wheels are made per day out of Salisbury iron. One of them was broken while we were there, and showed signs of great strength. Two of Root's blowers are used for the foundry and

RAIL MILL.

This mill is used not for making but for mending rails. This is done with Baines' rolls. As this process may be not very generally familiar to our readers, a brief description may not be uninteresting. We will begin by stating that the rails are mended by welding a piece of iron made out of a bar 2½ inches wide by ¼ inch thick and about two feet long. These pieces are made with a peculiarly shaped forked end, the prongs of which are bent down on each side and under the head of the rail, so as to hold it in position while in the fire, and when it is passed through the rolls and is being welded on. The pieces used for the ends of the rails have a fork at one end only, while those for the middle portion of the rail have them at each end. These pieces are placed on top of the rail and secured by the forks, and the rail is then heated to a welding heat at the place where it needs mending. When it is heated it is passed through a set of rolls, one of which presses the piece to be welded down in top of the head of the rail, thus causing the two to unite firmly. Two other disc-like rollers, whose planes are horizontal and axes vertical, press the roll in the web, thus preventing it from being too much upset while the process of welding is going on. The rail is then laid on its side and passed through two other grooved rolls similar to those used in manufacturing rails. The grooves are made of the form of the rail, and reduce the part which is being molded to the proper size and form. The rail is then cut off by a circular saw to the proper length and straightened, which completes the mend. The building occupied by the rail-mill is about 200x60 feet, and the rolls are driven by an engine with 14x36 inch cylinders. Twenty-five men are employed in the mill, who mend 110 rails per day, about half of which require to be mended in the middle as well as at the ends. This process is considered a very economical method of doing the work, and it is thought to be cheaper than mending rails by hand.

ENGINE HOUSE.

This building is located about 800 feet east of the machine-shop, and between it and the station building. It is semi-circular, with 29 stalls for engines, but, like nearly all similar structures, is much too small for the equipment of the road, and will be more so as soon as the orders which the company has given for locomotives are filled.

"BUNK ROOM."

It is obvious that the officers of this road regard the comfort of their men more than, we are sorry to say, is generally the case on other lines. Near the engine-house is the engine dispatcher's office. The second story is devoted to a dormitory, or, as the men call it, the "bunk room," for engineers and firemen, who are obliged to "lay over" while away from home. The room and the beds are kept scrupulously clean; the room is well ventilated, and a bath and wash room are provided on the first floor, so that the men can always be comfortable.

COMMENTS.

The plan of the main shop at Elkhart is, we believe, worthy of study by those who contemplate erecting similar buildings. The flat roof and comparatively low walls are certainly less costly than they would be if built with a steep "pitch," and if the roof trusses were made of a wide span. The buildings were designed by Mr. Charles Paine, then Chief Engineer of the road, but now its General Superintendent.

The shops at Elkhart are under the charge of Mr. William Hill. Mr. James Sedgeley is the Superintendent of Machinery of the whole line.

The Westinghouse Automatic Safety Brake.

The Westinghouse Air Brake has now been long before the public, has been extensively adopted and so thoroughly tested, both for ordinary use and as a reliance in case of danger, that nothing need be said in commendation of it. In its simplest form, as first introduced, it consisted of an air pump worked by an independent engine, by which air was compressed to any desired density into a reservoir under the cab from which air was admitted by the turning of a cock, at the pleasure of the engineer, in large or small quantities, through a system of pipes to the brake-cylinders, one of which was arranged under each car. Here the air pressure acted against a piston, the rod of which communicated motion to the brake levers and applied the brakes. The coupling pipes between the cars were provided with valves, which were automatically unseated when the couplings were united, and automatically seated themselves when the connection was broken. These couplings were held together by a fastening which secured them in union with each other while the train was running, but which permitted them to be separated in case of disaster to the train by the breaking of a car coupling. In case the train broke in two, the couplings would thus separate, and the valves therein would seat themselves and retain in the brake-pipes and cylinders any air

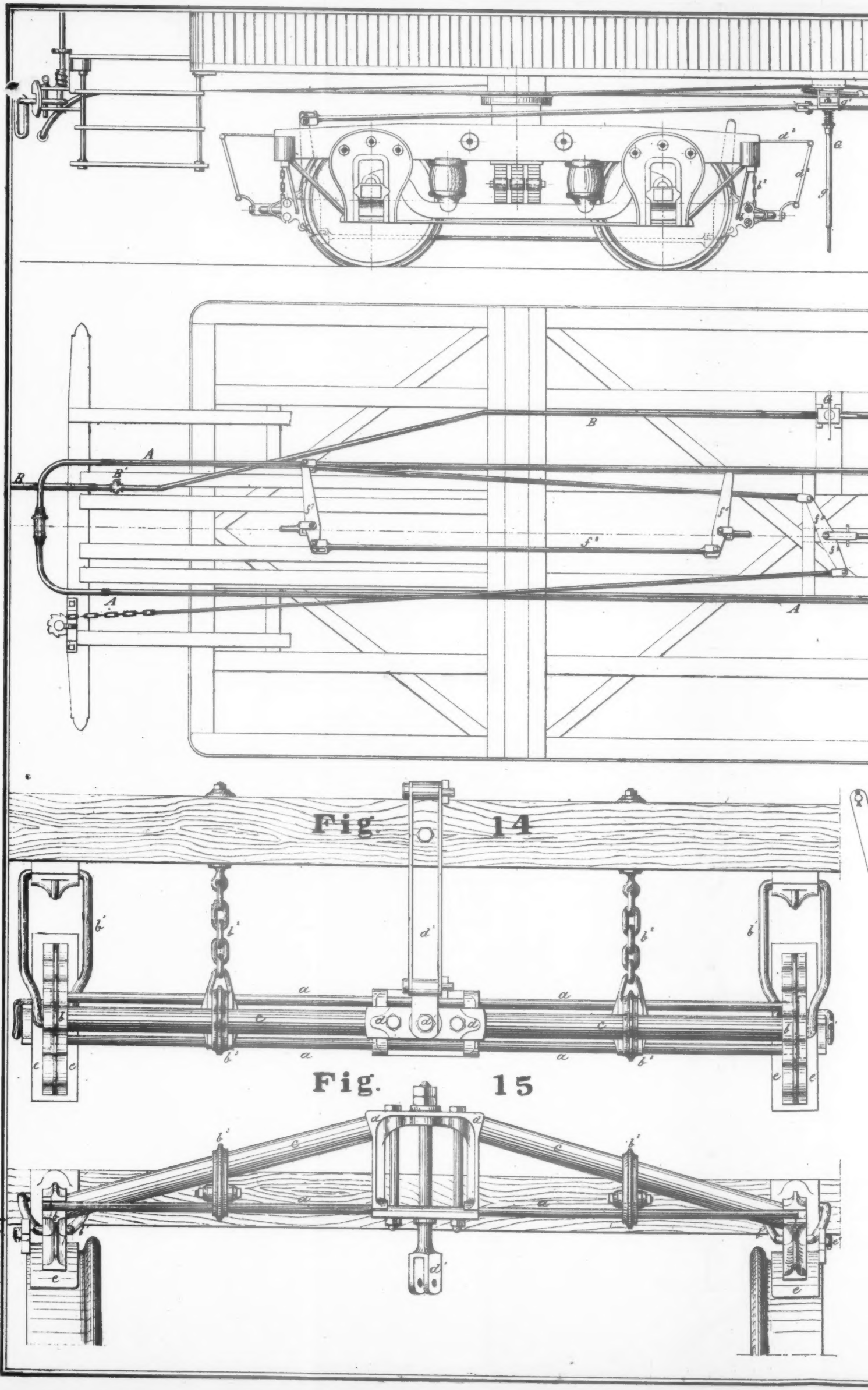


Fig. 14

Fig. 15

Fig. 1

WESTINGHOUSE AUTOMATIC SAFETY BRAKE.

Manufactured by The Westinghouse Air Brake Co. Pittsburgh Pa.

Fig. 2

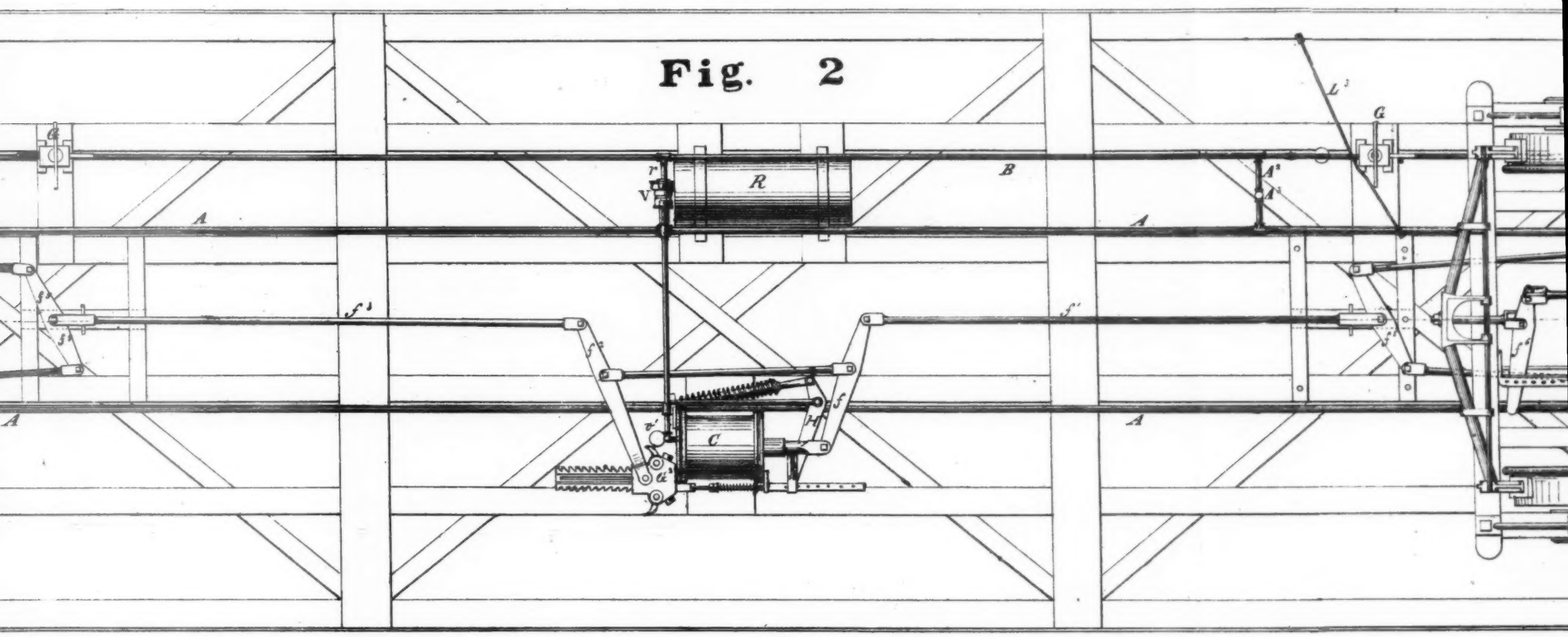


Fig. 16

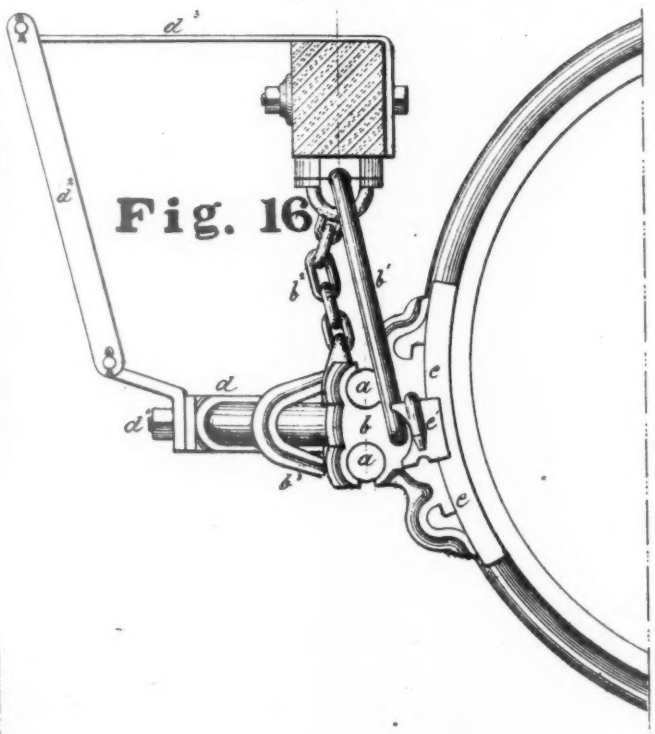


Fig. 11

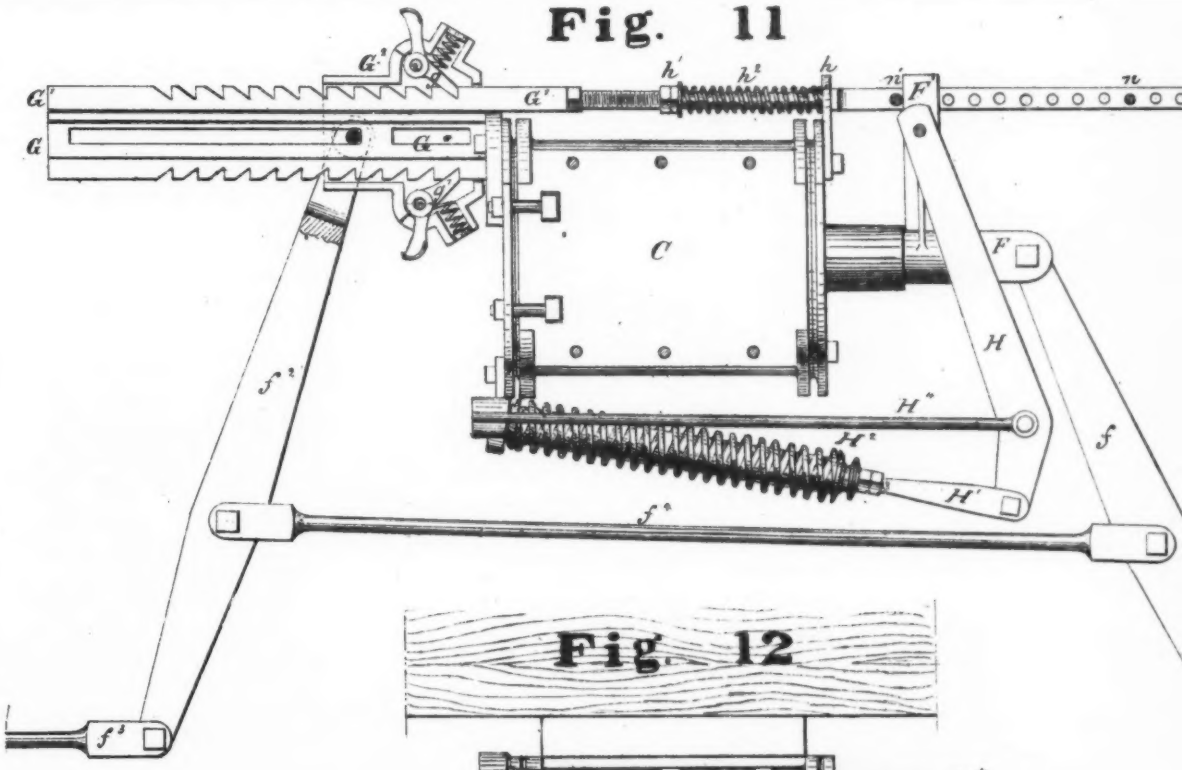
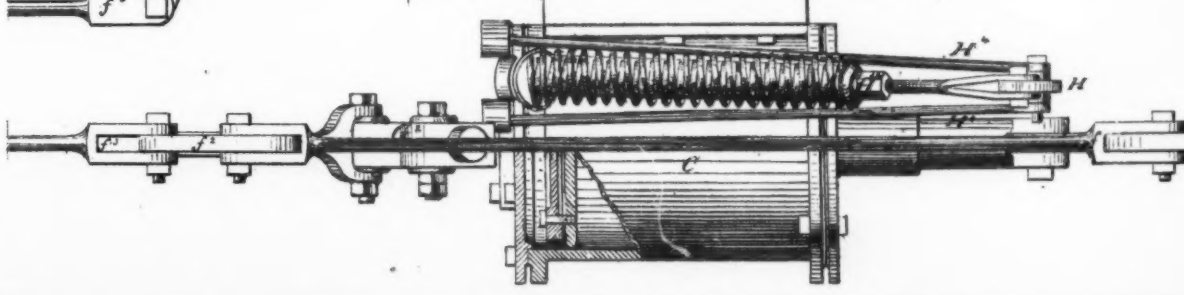


Fig. 12



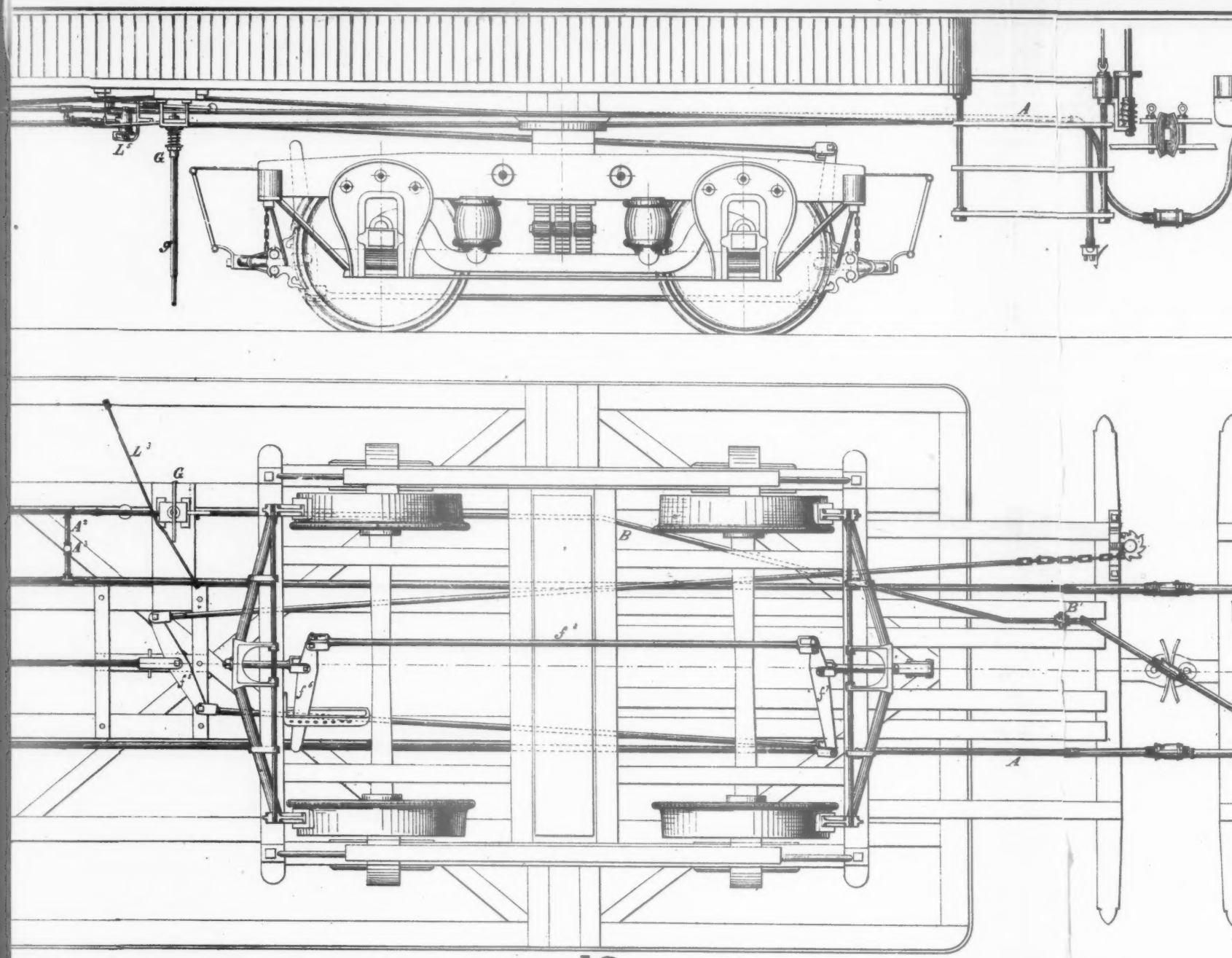


Fig. 11

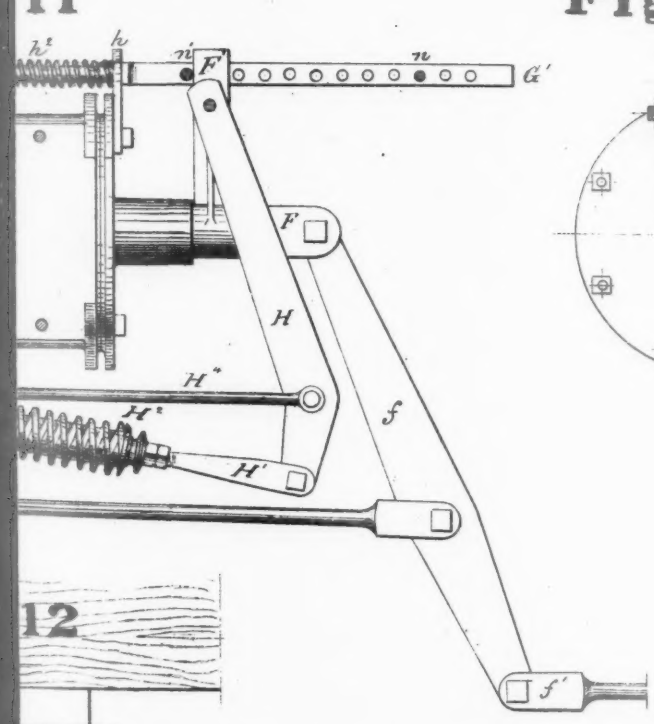


Fig. 12

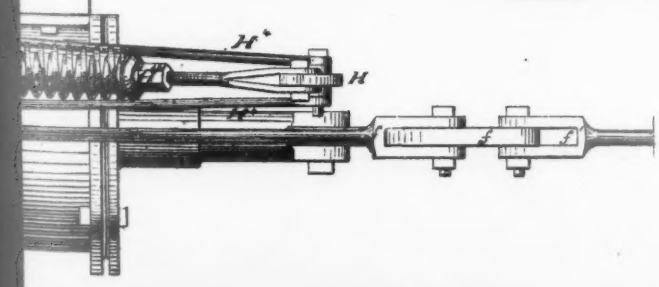
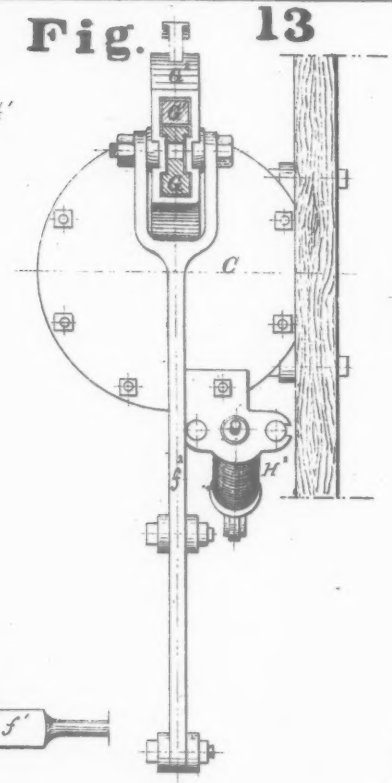


Fig. 13



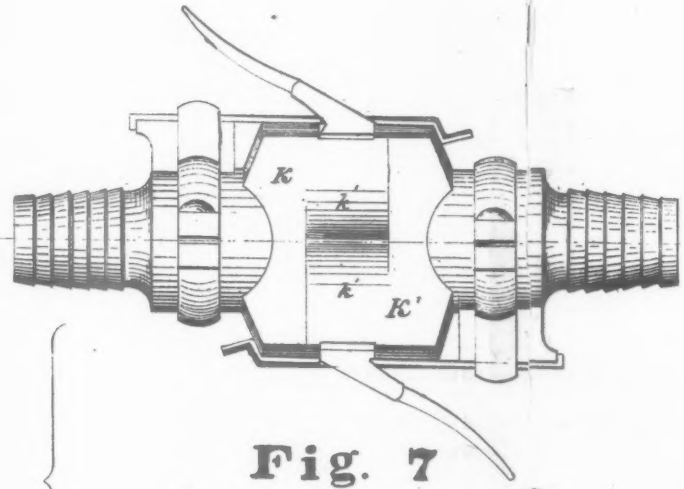
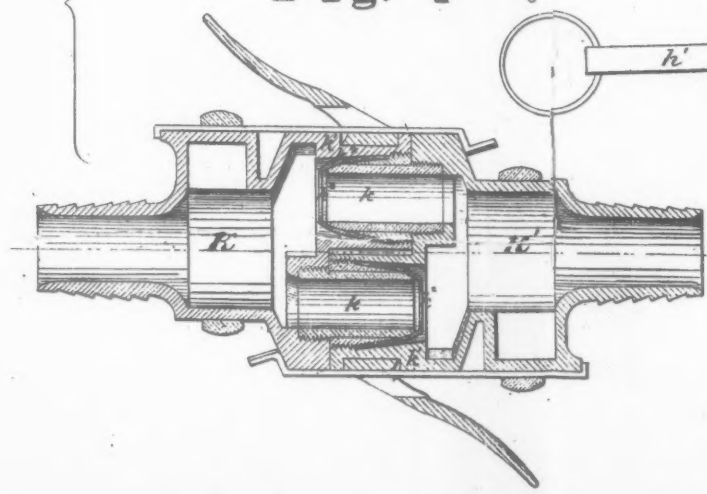


Fig. 7



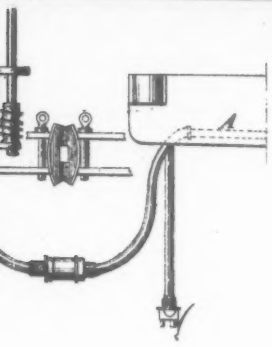
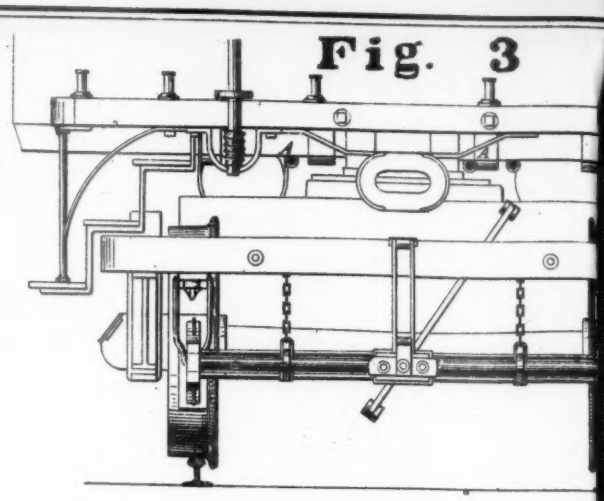


Fig. 3



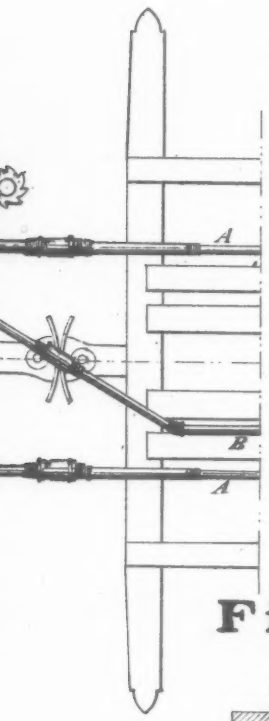


Fig. 4

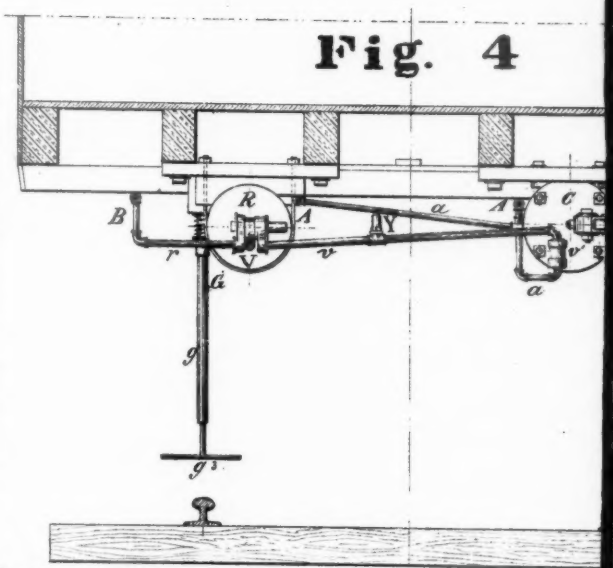


Fig. 6

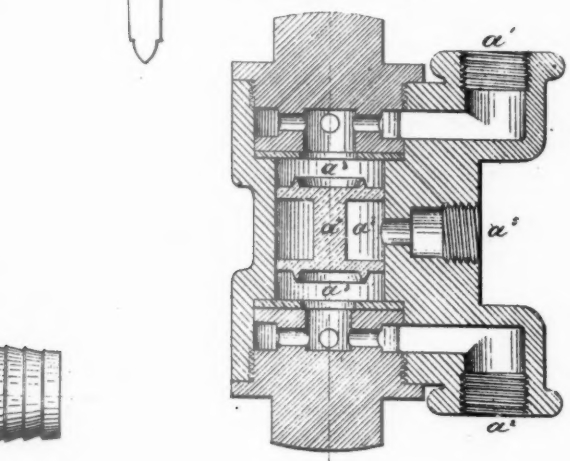


Fig. 10

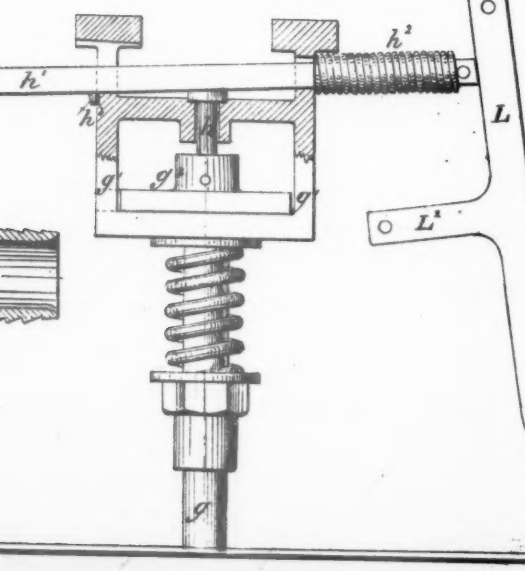
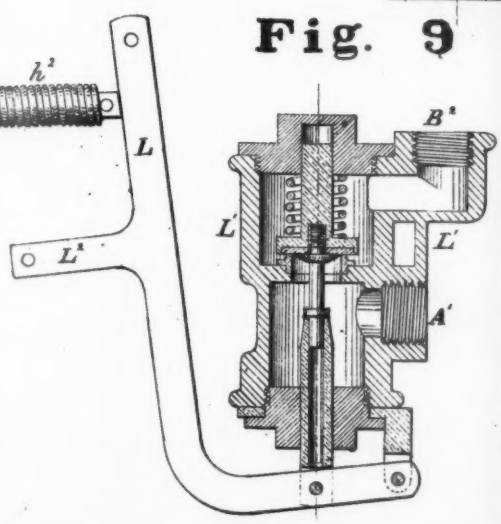


Fig. 9



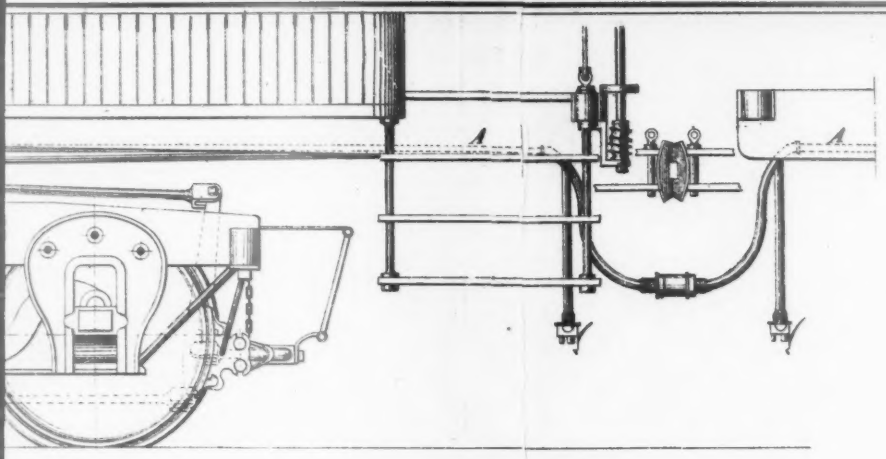


Fig. 3

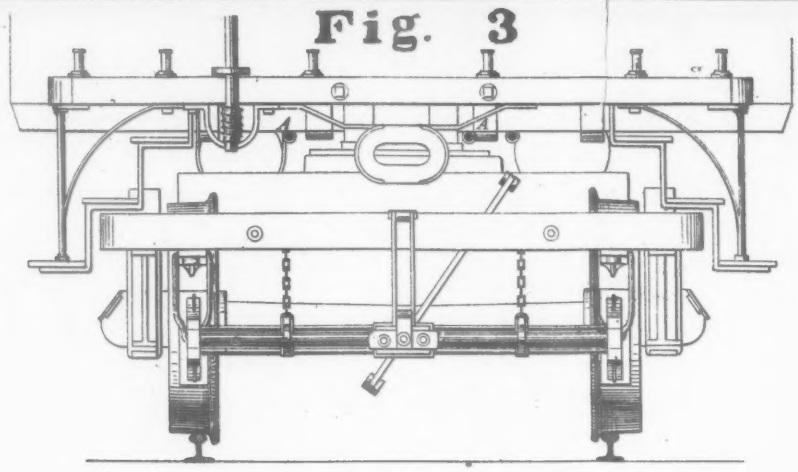
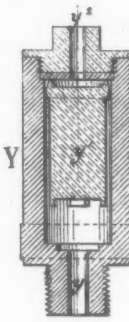


Fig.



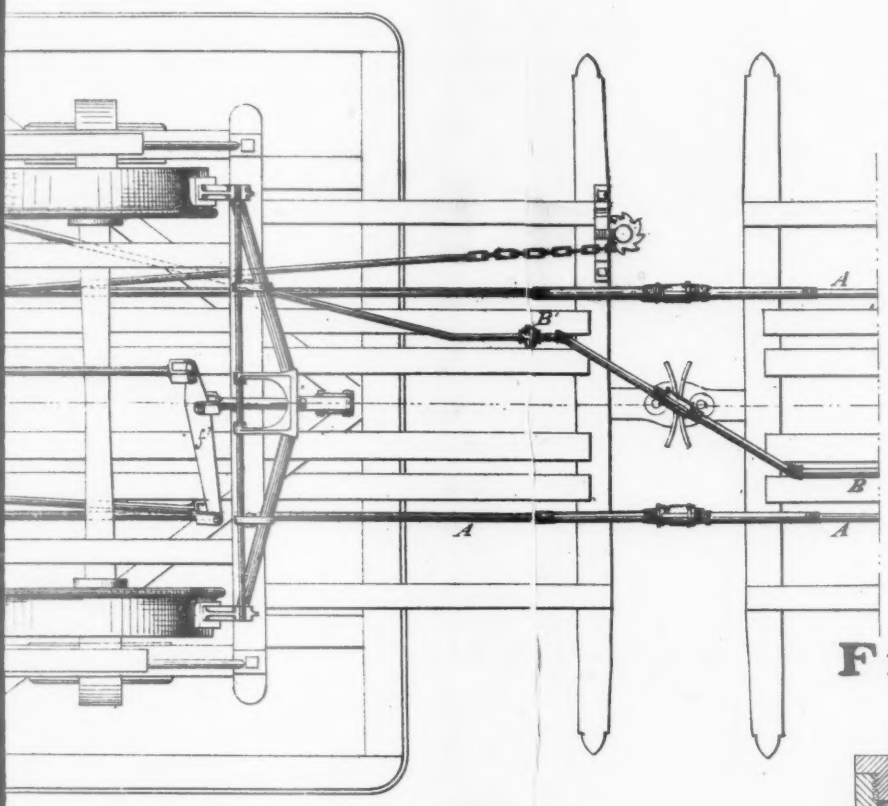


Fig. 4

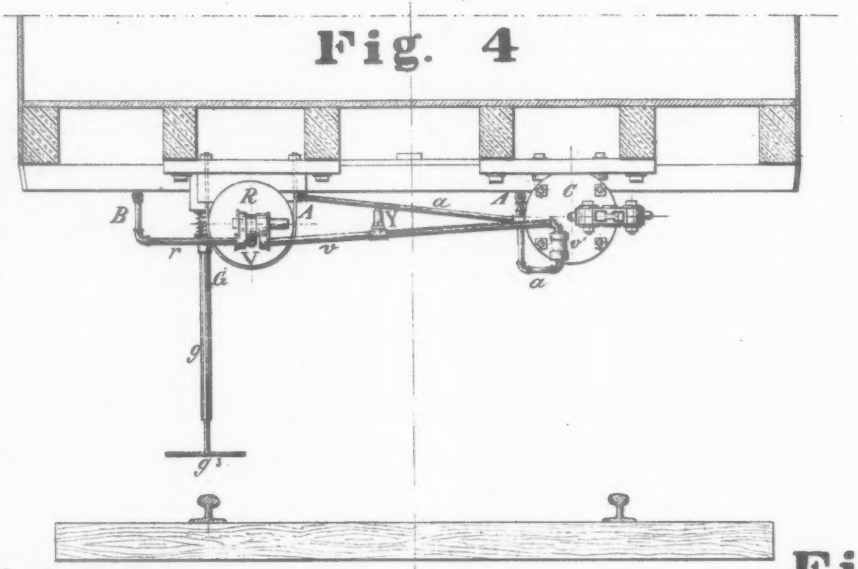
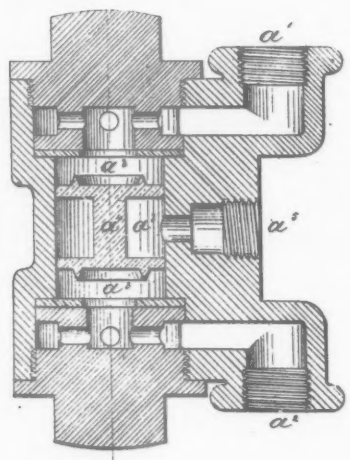
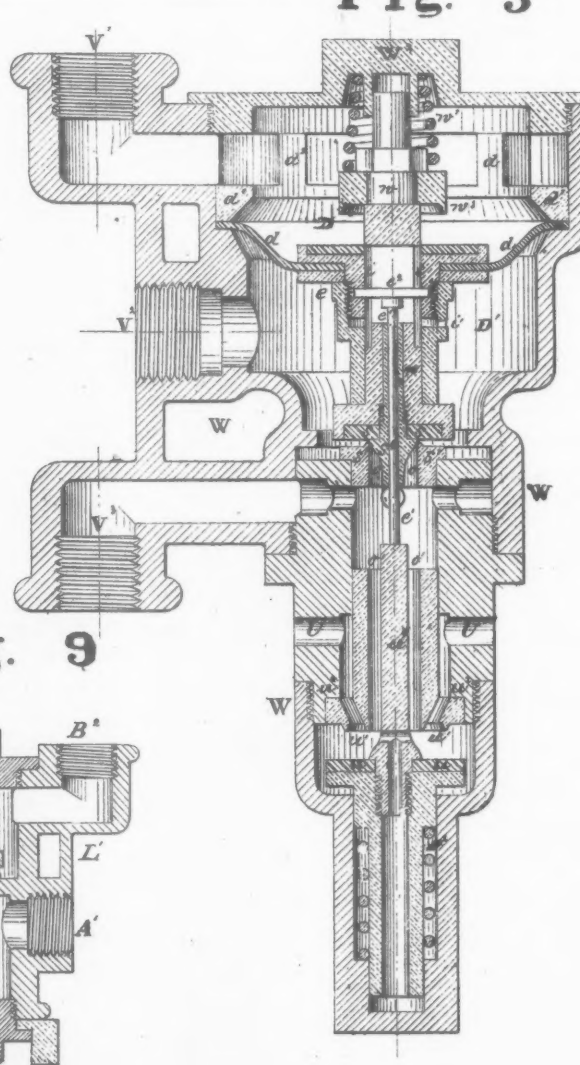


Fig. 6

Fig. 5





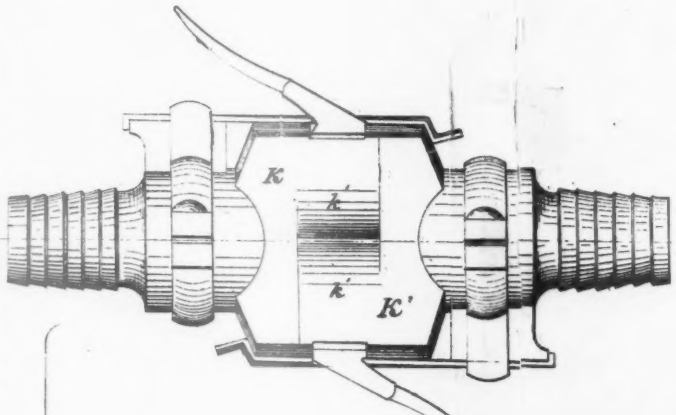


Fig. 10

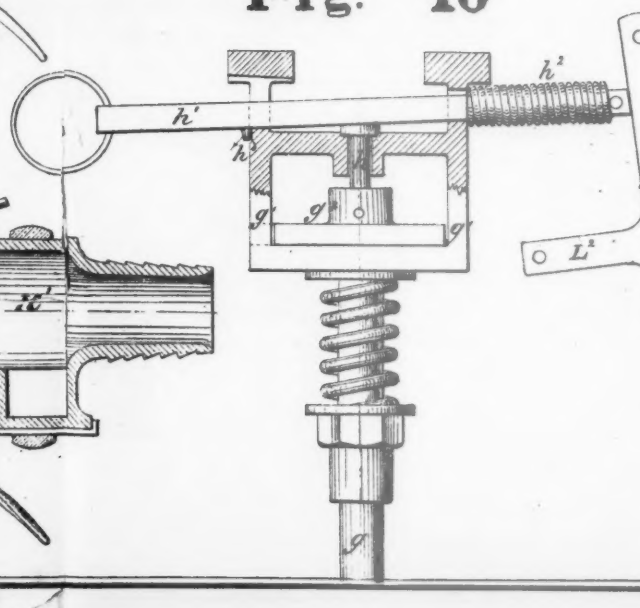


Fig. 7

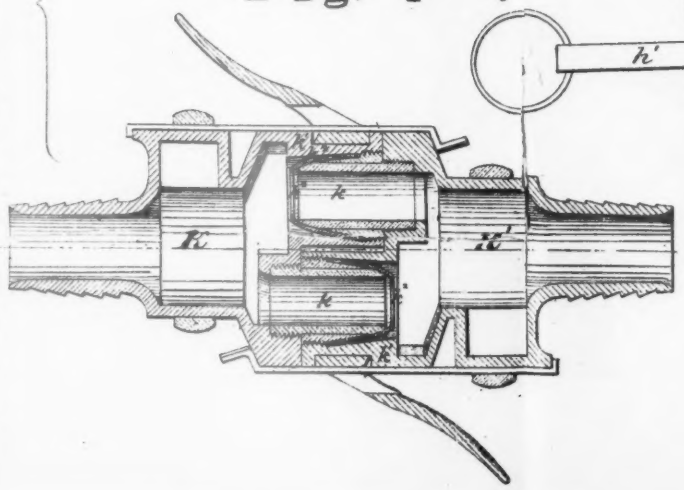


Fig. 9

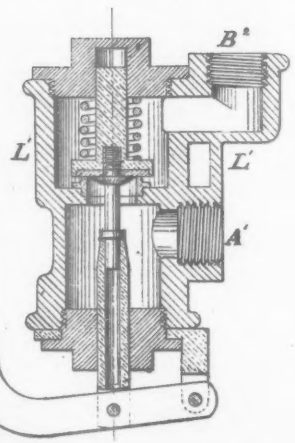
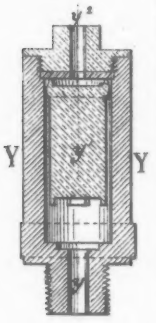


Fig. 8



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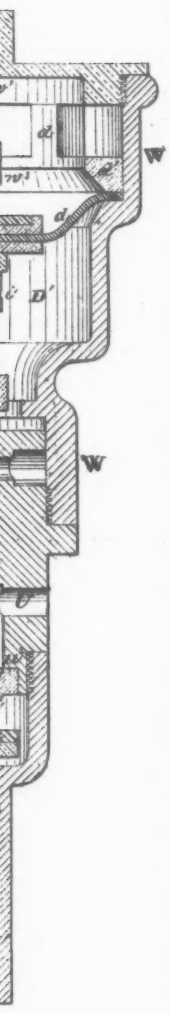

pressure which might have been admitted, and, of course, hold the brakes to the wheels until the train, or each separate part of it, if broken in two, was brought to a full stop.

While this apparatus has proven to be a very valuable improvement, and as such generally acceptable to railroad men—it being in use on about two thousand locomotives and some seven thousand passenger cars, and on over one hundred and fifty lines of railroad—still experience has shown that it was capable of still further improvement, in order to be fully adapted to meet all the requirements which it is desirable that a brake should fulfil.

The inventor, Mr. Westinghouse, anxious to make his invention as perfect as possible, has, by further improvements, so perfected his system that he is confident that it now satisfies every requirement or fills every function which a railroad brake can reasonably be expected to perform.

These improvements, in their salient features, are illustrated by the drawings published herewith, which, in connection with the following description, will, we think, make their construction and operation plain.

These improvements consist, first, in attaching to each car a reservoir auxiliary to the main reservoir on the locomotive, which auxiliary reservoir is kept charged with compressed air, by means of an independent line of pipe, specially designed for that purpose, which leads from the main reservoir back through the train and communicates with each auxiliary reservoir. The communication from this pipe with each auxiliary reservoir is through a triple-valve device of peculiar construction, such that by the introduction of compressed air each auxiliary reservoir may be charged therewith, and by lowering the pressure in such pipe—either intentionally or by accident, as in case of disaster to the train—the triple valve will shift position so as to prevent the escape of air from the auxiliary reservoir, except through a pipe which leads therefrom directly to the brake cylinder and thereby applies the brakes. The brakes are released by again increasing the pressure in the brake-pipe referred to, by which means the triple valve is shifted so as to open the escape port from the brake cylinder, and also to provide for the recharging of the auxiliary reservoir. While by this means one mode is provided for applying and releasing the brakes, a double line of pipe extending from the main reservoir back under the train also enables the engineer to apply the brakes as in the old way, so that two independent ways are provided for applying the brakes, either of which may be used independently of the other when both are in order, and without the other when one is broken. Also, these devices are so arranged on the train that a car furnished with either set or with the old set, as heretofore used, may be made up into a train with cars having the complete outfit above indicated. And the pipes of these two systems are so connected together with an interposed double check valve, that when either system is used all communication with the pipes of the other system is automatically closed.

A further improvement consists in combining with the apparatus above indicated a trip device which, when a car leaves the track, is thereby released so as to open a port in the charging pipe of the new system, and thereby lower the pressure therein and shift the triple valve above referred to, so as to allow compressed air to pass from each auxiliary reservoir to the brake cylinder.

In the accompanying engravings, figs. 1, 2 and 3 illustrate the application of the improved system to the ordinary passenger car, in which A represents a double line of brake pipe, such as is already used, by means of which the brakes are applied by admitting air from the main reservoir directly into the brake cylinder C, through a common pipe a, shown in fig. 4. By this means the brakes are applied in the manner heretofore practiced; but the present improvements include the introduction of a third pipe, B, which is kept in continuous open communication with the main reservoir on the locomotive. This pipe B communicates with the auxiliary reservoirs R by means of a branch, r, and a pipe valve, V, which is shown in enlarged sectional view in fig. 5. This triple valve has a port, V^1, for the inflow of air from the pipe, r, and port V^3, which communicates with the auxiliary reservoir R, and a third port, V^2, which by a pipe, v, communicates with the brake cylinder C through the double check v^1, shown in enlarged sectional view in fig. 6. The triple-valve devices of fig. 5 consist of a valve case, W, and central longitudinal stem, w. The upper part of the valve case W is divided into two chambers, D and D^1, by means of a flexible India-rubber diaphragm, d, the outer edge of which is compressed between the ring d^1 and a shoulder on the valve case. This ring d^1 has several studs, d^2, upon which the cap, W^2, screws firmly, holding the rubber diaphragm d, and the inner edge of which is included between the upper and lower halves of a compound nut, e. This compound nut has a vertical sliding motion on the stem w, and in thus sliding up and down, with a greater or less pressure of air above or below, it alternately covers and uncovers an annular port i, which is made by reducing the diameter of the stem w, at the appropriate place. This annular port, i, at its upper end communicates directly with the upper chamber D, and at its lower end with the lower chamber D^1, by means of the port i^1. The stem w has a valve, s, near its lower end, which by suitable packing sits on an annular ring, s^1, which surrounds a port, o, by means of which port communication is effected between the chamber, D^1, and the port V^2, which leads to the brake cylinder. The lower extension of the valve case W contains a valve, u, which seats upwardly against two annular rings, u^1, from between which rings the ports u^2 lead out to the escape ports, U. The stem u^2 of the valve u is surrounded by an annular passage, o', so that the air escaping from the brake cylinder through the port V^2 may, when the valve u has become unseated, pass by the ports o^1 and u^2, out at the escape ports U. This valve u is pressed to or toward its seat by means of a spiral spring, w^2, and is forced from its seat by means of a pin, e^1, and cross-bar, e^2, the ends of which cross-bar are fixed in the compound nut e and which passes through and moves up and down in a slot made in the stem w for that purpose. The stem w is pressed downward by a spring, w^1, so as to press the valve s to its seat; and it carries at its lower end a tapering plug, s^2, which occupies the bore of the port o, and acts as a guide for the stem w.

The operation of the devices thus described may be briefly stated. The air pressure is transmitted back through the pipe B, and by the branch r enters the port V^1 of fig. 5 and the upper chamber D. Acting downwards on the diaphragm d, it depresses the compound nut e, so as to uncover the upper end of the annular port i, and allow the air thus introduced to pass through the ports i, i^1 into the lower chamber D^1, and thence by the port V^2 into the reservoir R of fig. 2. In this way this auxiliary reservoir R is kept continually charged with compressed air. At the same time, the downward motion of the compound nut e acting through the cross-bar e^2 on the pin e' (the valve being held to its seat by the spring w^1, or by air pressure) unseats the valve u, and leaves an uninterrupted communication for the escape of air from the brake cylinder C of fig. 2 through the ports V^3, o^1, u^2 and U. Hence the brakes will in such condition be off, or disengaged.

If now the engineer desires to apply the brakes, he allows air to escape from the pipe B, the result of which is that the pressure is reduced in the chamber D, so much so that the back pressure of the air in the reservoir R, acting back through the port V^2 against the lower side of the compound nut e, will cause the nut to slide upward on the stem w, so as to close the annular port i, and, seating itself against the annular ring w^3, will make an air-tight joint therewith, and prevent the escape of air in a backward direction. This pressure also results in compressing the spring w^1, and, at the same time, lifts the valve s from its seat, and opens communication from the chamber D^1 through the ports o and V^3 to the brake cylinder C, so that the latter will thereby become charged with compressed air and the brakes be applied. Also, and at the same time as the compound-nut e goes upward, it relieves the downward pressure on the valve u, so that the spring w^2, in the lower end of the valve-case, acting upward on the under side of the valve, will seat the same before the valve s has left its seat, and thereby prevent the outflow of air at the ports U.

It will be observed that the efficiency of this apparatus depends simply on the greater or less amount of air pressure above or below the diaphragm d. When this pressure is the same above and below, the valves s and u will be seated, and the annular port i will be closed. The least increase of pressure above the diaphragm will, in the manner described, further charge the reservoir and at the same time open the lower valve u. With the least decrease of pressure the valve s will be raised slightly, so as to open the port o and permit the flow of air from the reservoir R to the brake cylinder C, which flow will continue until there is a equilibrium of pressure in the chambers D and D^1, and then the valve s will be reseated and the port o closed.

Thus the force with which the brakes are applied to the wheels is regulated by the amount of reduction of pressure in the pipe B, which matter is under the control of the engineer; and to apply the brakes suddenly and with full power, the entire air pressure in the pipe B may be allowed to escape, in which case the valve s will be opened wide and remain so until by recharging the pipe B the equilibrium is restored, and if the pressure be further increased in the chamber D, the valve u will be unseated and the brakes released.

The compressed air, whether admitted from the pipes A A or by means of the triple valves from the receiver R, enters the brake cylinder C through the same pipe; but communication from one set of pipes to the other is prevented by introducing, as shown in fig. 4, a double check valve v^1, which is shown in enlarged sectional view in fig. 6. The pipe a, which leads from the pipe A, enters at the port a^1, and the pipe v, which leads from the reservoir R, enters at the port a^2. These two ports a^1 and a^2 open into a common chamber, a^3, in which chamber is arranged a double-ended check valve, a^4, which is made somewhat shorter than the chamber, so that it may move in either direction and seat either way. From this central chamber a^3, a side port, a^5, leads directly to the brake cylinder C. If air be admitted at either port, a^1 or a^2, the opposite port will be closed by the check valve a^4, being thrown over so as to leave an uninterrupted communication into the brake cylinder through the port a^5. The valve a^4 is provided with wings which act as guides, between which are open passages for the flow of air around and past the valve seat.

Since with the pipe B the brakes are applied by reducing the air pressure therein, the pipes B are united between cars by means of couplings which do not contain valves; so that when the cars become separated intentionally or by accident, and these couplings are disunited, the escape of air from the pipes applies the brakes throughout the whole train.

Couplings suitable for the pipe B are shown in plan and sectional views in fig. 7. These couplings are made each in two parts, K and K^1, each part having a male half, k, and a female half, k^1, the joints of the male and female parts being covered by an elastic packing ring, k^2. For convenience in coupling and uncoupling, spring hooks and levers are provided, so that the brakeman, in grasping the couplings, depresses the levers and raises the hooks at one operation. As each coupling has both a male and female part, it is obvious that a car may be reversed in position and still readily be coupled to any other car of the train. The pipes B, on each car are provided with cocks, B^1, near each end, all of which remain open when the train is in running order, except the last one on the rear car, which is closed. When a car is to be detached from the train, both cocks, B^1, of that car are to be closed so as to retain the pressure of the air therein and prevent the application of the brakes. In such a case, if the air leaks slightly from the pipe B, the valve s, of fig. 5, will be raised slightly from its seat, and the air pressure will pass slowly from the reservoir R through the port o to the brake cylinder. In order to prevent the application of the brakes in this manner, an escape valve, Y, which is shown in enlarged sectional view in fig. 8, is arranged in the pipe v. (See fig. 4.) Connection is made with the pipe v by the port y, which port opens into a chamber occupied by a plug y^1, which is made a little shorter and a little smaller than the chamber, and has a valve-shaped upper end, so as to seat upward when the pressure is great and close the escape port y^2. But in the case supposed, the pressure caused by leakage being small, the air which escapes into the brake cylinder will pass readily by the port y up and around the plug y^1, without lifting it to its seat, and escape at the port y^2. This plug y^1 is proportioned so that it will not be raised unless the leak is so great as to require attention. As already stated, any opening in the pipe B will result in the application of the brakes to the wheels throughout the whole train. To secure this result in case of a car leaving the track from the breaking of a rail, or from other cause, a tripping device is connected with the pipe B in such way that in case of an accident such as last referred to, such trip will strike the rail or ties, and thereby disengage a spring which opens a valve in a valve-case and thereby discharges air from the pipe B. This tripping device is shown at G, in figs. 1, 2 and 4, in its general arrangement, and the particular features of construction are illustrated in figs. 4, 9 and 10. The tripping arm g, which is made extensible, as shown in figs. 4 and 10, extends down to within such proximity to the track that in ordinary use it will run clear, but when a car leaves the track, a cross-bar, g^3, thereon will necessarily engage the rail, ties, or ground. At its upper end it projects inside of the frame or box g^1, and is fastened to a plate, g^2, in such position that, being thrown out of line in any direction, it will, the edge of the plate acting as a fulcrum, raise the center of the plate against a pin, h, the opposite end of which pin bears against a horizontal bar, h^1. This bar h^1 has a spiral spring, h^2, at one end, at or near the end by which it bears against the bent lever L of fig. 9, and so arranged as, when free to act, it will, in the manner presently to be described, shift the valves in the valve-case L^1, and discharge air from the pipe B. The bar h^1 on the opposite of the box g^1 has a lug or catch, h^3, which, when the apparatus is in running order, is, by drawing back the bar h^1, caused to engage the box g^1 in the manner shown in fig. 10, and thereby compress the spring h^2 and allow the lever L of fig. 9 to be in the position shown in this figure. The port B^2 has an open pipe communication with the pipe B, and the port A^1 either communicates with the external air, or, when the two systems are used together, communicates by a cross-pipe, A^2 (fig. 2), with one of the brake pipes A, and thence with an alarm whistle on the locomotive, so that the escaping air shall give a signal to the engineer of the accident that may have occurred. When the port A^1 is connected with the pipe A, a common check valve is arranged in the pipe A^2 to prevent the air passing to the valve box shown in fig. 9. This valve is shown in fig 1 at A^3.

Between the ports B^2 and A^1 of fig. 9 are a valve and a valve-seat with springs, as shown, such that when the train is in running condition, communication will be closed between the two ports. But in case of accident, the spring bolt h^1 is, in the manner above described, shifted so as to release the lug or catch h^3, and then the spring h^2 acting thereon forces it endways against the lever L of fig. 9, whereby the valve l will be opened and air will be discharged from the pipe B through the ports B^2 and A^1, and then in the manner already described the brakes will be applied in consequence of the reduction of the pressure in the upper chamber D of fig. 5.

By means of the valve shown in fig. 9 (its place in the apparatus being indicated at L^3, fig. 1), and suitable connection from the lever L to the inside of the car, provision is made by which the conductor or other employee may, at pleasure, apply the brakes, without waiting to communicate a signal to that effect to the engineer, though, as already stated, at the same time that the conductor thus applies the brakes he will give a signal of such fact to the engineer by means of the whistle or other alarm above referred to. When the brakes are applied in any part of the train, the communication between the pipes B and A must be kept open; for, if closed, the brakes will be released by the pressure being restored in the pipe B.

The arrangement of the lever for applying the brakes from the inside of the cars is shown in fig. 2 at L^3. The outer end of this lever has a connection extending inside of the car, while the other end is fastened in a jaw fixed to the bottom of the car. This lever L^3 passes under the arm L^2 (forming a part of the lever L) in such a manner that the valve l will be raised when the outer end of the lever L^3 is raised by the connection extending to the inside of the car.

While there is only one of the valve devices shown in fig. 9 to each car, there are two tripping arrangements, one striking by its bar, h, directly against the arm L; while the other is connected to the arm L by a strong wire extending thereto from its bar, h^1. One of these tripping devices would answer if arranged in the center of the car, provided that the cross-bar g^3 could be run close enough to the rail. In practice it is found best to use one near each end of the car, where there will be a sufficient downward motion, when the car leaves the track, to insure the application of the brakes by the cross-bar g^3 striking the rail or ties as described.

Another material improvement which has been introduced by Mr. Westinghouse consists of an automatical operating arrangement by which the slack motion caused by the wearing away of the brake shoes, or by the bending of the brake levers or the stretching of the brake rods, shall be taken up from time to time, as it occurs. The features of this improvement are represented in enlarged view in figs. 11, 12 and 13, and their connections with the brake rods and levers are clearly illustrated in fig. 2.

The brake cylinder C is attached to the bottom of the car. It is provided with the usual piston and stem F, from which the brake lever f makes connection, directly or indirectly, with one of the brake rods f^1. To the opposite end of the brake

cylinder C is fastened a ratchet bar, G, having a slot as shown. A like ratchet bar, G^1, extends along parallel with it, and a box, G^2, surrounds them both, as shown; but such box is so shaped that while otherwise free to slide easily back and forth on the ratchet bars G and G^1, such motion will be prevented except at the proper times by the pawls g and g^1, which pawls engage the ratchet teeth and are held down to their work by springs, as shown, and are released for purposes of readjustment by thumb-pieces. The bar G^1 extends past the brake cylinder, and its prolonged end passes through a guide, F^1, which projects out from the piston stem, and has a series of holes in which to insert pins or stops, n n^1. It also passes through a bracket, h, between which bracket and an adjustible nut, h^1, is a spiral spring, h^2, which spring presses the bar G^1 against the pawl g. The box G^2 has pivoted thereto a forked lever, f^2, as shown, which lever is connected with the opposite brake rod f^3. The levers f f^2 are connected together between their pivoting points by a tie-rod, f^4, through which an equal force is applied to each of the rods f^1 f^3, which can be varied according to the greater or less pressure of air, according as the pivoting points of the tie-rod f^4 are shifted one way or the other along the levers f f^2.

When the brake shoes are properly adjusted, the levers and rods should be so proportioned that the piston in the brake cylinder C will have a travel of about ten inches when the brakes are applied with the greatest power. In the movement of the piston F, the arm F^1 attached thereto slides freely on the adjacent end of the bar G^1. At a point not inside of the extremity of its longest motion, a stop or pin, n, is inserted in one of the holes of the bar G^1, and a like pin or stop, n^1, is inserted just back of the position which the arm F^1 occupies when the brakes are fully released. Then the arm F^1 will, in the operation of the brake, slide back and forth between these stops or pins. As the shoes wear away by friction, or as the levers spring or bend, the piston stem F, and with it the arm F^1, will necessarily have a longer travel, and hence with each outward thrust will engage the stop or pin n, and thereby shift the bar G^1 in the same direction, and in doing so compress the spring h^2.

When the length of increased travel thus occasioned is equal to the distance between two of the notches of the bar G^1, the bar will be shifted one notch to the right, and the pawl g will engage the next tooth.

When the brakes are released and the piston stem F travels back, the elasticity of the spring h^2 forces the bar G^1 to the left, and by means of the pawl g carries with it the box G^2 an equal distance to the left and causes the pawl g^1 to shift its position to the next notch in the ratchet bar G, and thereby increases the distance between the pivoting points of the levers f and f^2, and draws the opposite ends of the levers which are attached to the brake rods f^1 and f^3 so much nearer together. In this way the pivoting points of the brake levers relatively to each other are shifted to an amount such that the brake shoes will have the same position relative to the wheels as when first adjusted, and the slack motion caused by the wearing away of brake shoes cannot at any one time be greater than the distance between two adjacent notches of the ratchet bar, which is an inch and a quarter, representing about $\frac{5}{16}$ of an inch to each shoe.

As the arm F^1 comes back, it strikes the pin n^1 and assists the spring h^2 in shifting the position of the bar G^1, in the manner above described, and this operation is further facilitated by means of a lever shown at H, which is pivoted at one end to the arm F^1, and at its other end to a rod H^1 operating against a spring H^2, and with tie-rods, H^4, extending from between the pivoting points to a bracket on the opposite end of the cylinder, against which the spring H^2 has its bearing.

When the brakes are released, the spring H^2, acting on well-known principles, imparts a more rapid reverse motion to the piston and its stem F so as to release the brake shoes more quickly, and at the same time brings the arm F^1 with more force against the pin n^1, and thereby effects the readjustment or the taking up of the slack motion with greater certainty.

It will be observed that the lever H is bent, and that as the piston stem F comes back, the spring H^2, though weaker toward the latter end of the backward stroke, still acts more nearly at a right angle to the shorter arm of the lever, and consequently with greater force, so as to be most efficient at the conclusion of the reverse stroke of the piston, at which time there is little or no co-operation of other agencies in effecting this reverse movement. In this apparatus no adjustment of the brake shoes is required except that which is made when they are put on new.

Mr. Westinghouse has also made an improvement in brake beams, and in the mode of attaching the brake shoes and hanging the brakes to the trucks, as represented in figs. 14, 15 and 16. The beam consists of tie-rods, a, which by opposite heads have each a bearing at each end on the outside of the shoe-holders b, and a truss arch consisting of two pieces of gas pipe, c, each of which bears at its outer end against the inside of the shoe-holders b, and at its inner end against an interposed frame, d, by which the truss and tie-rods are connected together, and through which connection is made with the brake-rods by the jaw bolt d^1. The brake shoes e are slipped on to the holders b and held in position by means of rotating hooks e^1, and the shoes and holders are so shaped that they are reversible; that is to say, the same shoe, being inverted, may be slipped on to and fastened to either shoe-holder, and on their faces they have a taper adapted to the coning of the wheels. These devices are hung to the truck-frame by links, b^1, and the lower ends of these links are held in place in the shoe-holders b by means of the shoes e, and on the removal of the shoes e the links b^1 may be slipped out of their seats in the shoe-holders and new shoe-holders or new links inserted at pleasure. The safety chains b^2 are an additional device for carrying the brake beam in case of accident. Each chain extends from the truck frame down to the clamp, b^3, which encircles and more effectually holds together the tie-rods a and the truss-bars c.

To prevent the tipping of the shoes as they move from the wheels, the crown of the arch is connected by a link, d^3, with a strap spring, d^3, which has sufficient strength to carry the weight suspended thereto, and sufficient elasticity to yield when the brakes are applied. The length of the link d^2 is such that, as the brakes swing back away from the wheel, the links b^1 and d^2 have a parallel motion. Or, in other words, the brake shoe e while moving from the wheel will preserve an equal distance therefrom from one end to the other of its face. The advantage of this arrangement will be apparent to those experienced in railroading, who not unfrequently observe a brake shoe touching the wheel at one end and an inch or an inch and a half from it at the other end, which represents an average of half an inch of lost motion to each shoe, requiring a movement of eight inches of the piston.

These improvements have been used for some time on several lines, and the inventor confidently makes the following claims for them:

"The apparatus has been thoroughly tested and has proven to be all that can be claimed for it. It provides for the attainment, with all the certainty that can be anticipated in connection with mechanical appliances of any kind, the following results, which are of the greatest importance, both to the traveling public and to all interested in the operation of railroads:

"1st. The greatest attainable security against disaster in case of accident.

"2d. The most effective means yet devised of guarding against the occurrence of accident, by placing the train under the control of the engineer, and enabling a passenger or employee to stop the train instantly, in case of great emergency; and,

"3d. By a more perfect construction of apparatus to render the operation of the train—particularly of the brakes—more effective and prompt."

There can be no doubt that the great success of the brake as originally introduced was legitimate and well deserved; and its success and the demonstration it has made of the skill of the inventor and his appreciation of the qualities needed in a power brake rightfully incline railroad men to consider carefully and favorably the improvements which he believes to have made his invention as nearly perfect as a brake can be.

General Railroad News.

PERSONAL.

—Mr. E. R. Ford, long a director of the Albany & Susquehanna Railroad Company, died at his residence at Oneonta, N. Y., July 23.

ELECTIONS AND APPOINTMENTS.

—The first board of directors of the newly organized Iola & Arkansas River Railroad Company is as follows: John Francis, J. A. Christy, A. W. Beck, D. Harville, C. N. Weller, Iola, Kan.; T. H. Davidson, F. Butler, T. W. Wilson, Kalida, Kan.; W. H. Makeany, Garnett, Kan.

—Mr. T. J. Hamer has been appointed Master of Machinery of the Chesapeake & Ohio Railroad, and will have charge of the motive power and machinery of the whole line. Mr. Hamer has heretofore been Master Mechanic of the Western Division.

—The stockholders of the new Iron Mountain, Chester & Easter Railroad Company (formed by the consolidation of the Chester & Tamaroa and Chester & Iron Mountain Companies) met in St. Louis July 21 and chose the following directors: Edwin Harrison, Robert Rankin, St. Louis; D. C. Barker, Tamaroa, Ill.; J. C. Holbrook, Chester, Ill.; R. M. Davis, Pinckneyville, Ill.; F. W. Tracy, C. A. Beecher, Springfield, Ill.; W. B. Stephenson, Cincinnati, O.; W. P. Cutler, R. R. Dawes, E. C. Dawes, Marietta, O.; W. G. Barnard, Bellair, O.; F. W. Jones, New York. The board organized by electing officers as follows: President, W. P. Cutler; Vice-President, R. R. Dawes; Treasurer, E. C. Dawes; General Superintendent, D. C. Barker.

—Mr. J. B. Kennedy, who was recently chosen President of the Shenandoah Valley Railroad Company in place of Thomas A. Scott, resigned, having declined the position on account of ill health, the board of directors, at a meeting held in Charlestown, W. Va., July 22, elected Mr. McClelland, of Chambersburg, Pa., President of the company.

—Mr. J. S. Redfield has been appointed General Superintendent of that portion of the Northern Central Railway which is north of Williamsport, Pa. Mr. Redfield has been for some time Division Superintendent.

—At a meeting held in Shreveport, La., July 17, the stockholders of the Shreveport & Southwestern Railroad Company organized by the election of the following directors: W. E. Hamilton, Benjamin Jacobs, Isaac Kahn, N. W. Murphy, George Peyton, Thomas Poland and B. Witherspoon. W. S. Haven was chosen President; J. M. Foster, Vice-President; L. L. Tomkins, Treasurer, and F. A. Leonard, Secretary.

—Mr. Henry Tyson, late Manager of the Baltimore street railroads, and formerly in charge of the motive power of the Baltimore & Ohio Railroad, who was recently chosen Fourth Vice-President of the Erie Railway Company, is to have as his department the rolling stock and machinery of the road.

—Mr. Howard Fry, late Master Mechanic of the Eastern portion of the Grand Trunk Railway, is appointed to take charge of the locomotive department of the Erie Railway, and will probably have the title of Supervisor of Locomotives.

—At the annual meeting of the Portsmouth, Great Falls & Conway Railroad Company, in Portsmouth, N. H., July 15, the following directors were elected: Ichabod Goodwin, William H. Y. Hackett, Benjamin T. Reed, George W. Burleigh and Thornton K. Lothrop. The road is leased by the Eastern Railroad Company.

—At the annual meeting of the Eastern Railroad Company of New Hampshire, in Portsmouth, N. H., July 15, the following directors were elected: Benjamin T. Reed, William H. Y. Hackett, Robert W. Hooper, Ichabod Goodwin and Frederick W. Choate. The road is leased by the Eastern Railroad Company of Massachusetts, forming a part of its main line.

—At the annual meeting of the stockholders of the Portland Company, at Portland, Me., recently, the following directors were chosen: J. B. Brown, S. E. Spring, E. H. Davies, H. M. Payson, H. N. Jose, H. J. Libby, Joseph Walker.

—Mr. George T. Benedict, formerly Superintendent of the New London Northern, has been appointed General Freight Agent of the Cincinnati, Sandusky & Cleveland Railroad. Mr. J. C. Buxton, heretofore Superintendent and General Freight Agent of the road, will hereafter be Superintendent only.

—At a meeting of the directors of the Cairo & St Louis Railroad Company in St. Louis, July 23, Mr. F. Bross, of Cairo, Ill., was chosen a director and Secretary of the company in place of D. Hurd, who has resigned and removed to Colorado.

TRAFFIC AND EARNINGS.

—The earnings of the Kansas Pacific Railway for the second week in July were: from passengers, $26,285.56; from freight, $44,448.89; mails, $2,055.31; total, $72,789.76. Of this amount, $2,385.10 was for transportation of troops, mails and government freight.

—The earnings of the Marietta & Cincinnati Railroad for the third week in July were: 1873, $38,246; 1872, $35,542; increase, $2,704, or 7⅔ per cent.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the second week in July were: 1873, $17,187.30; 1872, $14,454.53; increase, $2,732.77, or 18⅞ per cent. The earnings for the week were affected to some extent by the operation of the new railroad law, the harvest and the prevalence of cholera at some points on the line.

—The earnings of the Chicago & Northwestern Railway for the third week of July were: 1873, $284,595; 1872, $239,587; increase, $45,008, or 18¾ per cent.

—The earnings of the Milwaukee & St. Paul Railway for the third week in July were: 1873, $167,470; 1872, $94,856; increase, $72,614, or 76½ per cent.

—The earnings of the Philadelphia & Erie Railroad for the month of June were: 1873, $353,943; 1872, $309,660; increase, $44,283, or 14¼ per cent. For the six months ending June 30 the earnings were: 1873, $1,964,523; 1872, $1,787,846; increase, $176,677, or 9⅞ per cent. The earnings per mile for the six months were: 1873, $6,821; 1872, $6,208; increase, $613, or 9⅞ per cent.

—The San Francisco *Bulletin* gives the following statement of the freight brought to that port by the Pacific Mail Company's Panama line for the first two quarters of the present year:

From	First Quarter.	Second Quarter.
New York, tons	3 057	2,175
Europe	2,106	2,308
Havana	120	12
South America	69	50
Central America	245	1,541
Mexico	170	123
Totals	5,797	6,209
Same time in 1872	8,015	7,635

By the Japan and China line the receipts for the same period were as follows:

	First Quarter.	Second Quarter.
For New York, etc., tons	1,552	2,236
For San Francisco	3,632	4,167
Total	5 184	6,393
Same time in 1872	5,959	2,565

—The following statement of the earnings and expenses of the Northern Central Railway for the six months ending June 30 has been published:

	1873.	1872.	Increase.	p. c.
Earnings	$2,403,409 47	$2,076,552 33	$326 857 14	15¾
Expenses	1.828,638 77	1,667,453 77	161 185 00	9⅝
Net earnings	$574,770 70	$409,098 56	$165,672 14	40½

The percentage of expenses to earnings in 1873 was 76.09; in 1872, 80.30. The gross earnings per mile for the six months were: 1873, $6,732; 1872, $5,817; increase, $915, or 15¾ per cent.

—The earnings of the Great Western Railway of Canada for the week ending July 11, were: 1873, £23,876; 1872, £20,136; increase, $1,741, or 18⅝ per cent.

—The earnings of the Grand Trunk Railway of Canada for the week ending July 12 were: 1873, £37,700; 1872, £34,400; increase, £3,300, or 9⅝ per cent.

CHICAGO RAILROAD NEWS.

The Effect of "Non-Discriminating" Rates.

Several of the railroads which lead into this city will show decidedly diminished receipts for the month of July, owing to the strict enforcement of the new railroad law. In some cases this decrease of earnings will not be permanent, since it is to a considerable extent due to the fact that the freighting business was anticipated quite largely during the month of June. But the grain-carrying business west of the Mississippi, as well as the cattle trade, is largely diverted southward to Quincy and St. Louis and other river points, whence easy shipping facilities eastward are attainable.

Just now there is a new element of dissatisfaction introduced among the people caused by the railroad companies refusing to ship stock and material free to the State fairs, which are to be held early in the fall. The railroad men hold that a just construction of the new railroad law would make concessions of the kind unwarranted and even prohibited discriminations. It is possible, however, that something may arise to cause the companies to reconsider their present purpose in that respect. The Railroad Commissioners have given an opinion that such action would be legal, but the Commissioners are not the courts, and have not nearly so good legal advice as the railroad companies.

Illinois Central.

This company reports no actual or prospective falling off in receipts on account of the operation of the new law, although in very many respects the operation of the law is oppressive and bad.

London journals of the 19th of July had announcements of the offering of this company of $3,000,000 of the 7 per cent. gold bonds of the New Orleans, Jackson & Great Northern Railroad Company's, and an equal amount of similar bonds of the Mississippi Central Company, payable in 1912, the price being £174 per $1,000 bond for the New Orleans, Jackson & Great Northern and £176 for the Mississippi Central bonds, with interest accrued since July 1 on the first and since May 1 on the second, and with the chief part of the payment deferred until October so as to make the proper issue price about £170. These bonds, with $10,000,000 more to be used almost exclusively to retire the existing bonded debt of the two companies, are a first mortgage on all their property and also on the extension of 106 miles to Cairo now well under way and partly completed. The Illinois Central has agreed, in consideration of a contract for a working agreement, to purchase yearly, for 30 years, at a price not exceeding par in currency, $100,000 of each issue of these bonds, thus covering the $6,000,000 now offered. The Illinois Central also offered to pay on presentation the principal and accrued interest of the remainder of its construction bonds ($3,338,500), not due until April 1, 1875, to such holders as will apply the payments to the purchase of the issues offered.

Subscriptions were received at the Illinois Central Railroad Company's offices in London and New York, at the New York office of the Southern Railroad Association (which works the two roads bonded) and by bankers in Amsterdam.

This makes it necessary for the Illinois Central to provide $200,000 a year for the purchase of the bonds, which, having

provided for the principal of the construction bonds, it can hardly find burdensome, and of course they remain its property after such purchase.

Chicago Freight Rates.

The new non-discriminating rates have not worked well in all cases, and revisions are the order. The Chicago, Rock Island & Pacific has revised its tariff throughout, largely reducing rates, and bringing the rate per hundred on coarse grain from Peoria to Chicago down to 13 cents, which will enable it to compete with the canal and the east-and-west roads. There has also been a general revision of rates on lumber to West Missouri and Kansas points, by which the rate per hundred will be 35 cents to Kansas City, Leavenworth, Atchison, St. Joseph, Boonville and Sedalia from Chicago, and 18 cents from St. Louis, Louisiana, Hannibal and West Quincy. It is also agreed to charge for weights above 20,000 pounds per car-load, and to weigh the cars regularly in order to collect on all excesses, which is an important matter, as car-loads of green lumber have been found to weigh 15 and even 17 tons—a dangerous weight with a small journal, though otherwise cars rarely suffer from it.

Chicago & Northwestern.

In advance of the annual report a statement of the earnings and expenditures of this company for the last fiscal year (ending with May last) has been made. It shows the gross earnings to have been $12,736,606.75, an increase of $1,347,079.97 over the previous year. The earnings were derived as follows:

From first-class passengers	$2,931,805 03
From second-class passengers	393,985 60
From excursions	85,033 10
From commutation	198,955 55
From freight	8,511,471 47
From transportation of milk	102,788 78
From transportation of express matter	237,530 75
From transportation of mails	205,337 31
From transportation of extra baggage	14,580 66
From miscellaneous sources	155,195 50

The operating expenses were $7,776,168.13. In the various works of construction carried on during the past year there have been expended $4,459,720.12, and for new equipment $1,438,013.96. The total charges for the year on account of extensions and the construction of new lines amount to $7,756,479.74. Notwithstanding these enormous outlays, which, together with the operating expenses, foot up a larger outlay than was ever before made by any corporation in the Western States during one year, the company declared two dividends of 3½ per cent. on the preferred stock and one of 3½ per cent. on the common stock. The gross sum representing the road is $63,115,551.66, of which $14,993,020.40 is common stock and scrip, and $21,484,063.42 preferred stock.

OLD AND NEW ROADS.

[CONTINUED FROM PAGE 309.]

Northwestern Union.

The last rail of this new road was laid July 27, the track layers from the two ends of the road meeting about seven miles southeast of West Bend, Wis. Trains will be run over the road in a few days.

The road (commonly known as the Fond du Lac Air Line) extends from Milwaukee, Wis., northwest to Fond du Lac, 67 miles. Nearly all the grading was done and some little track laid last year. It has been built in the interest of the Chicago & Northwestern, to which company it is to be leased. The distance from Chicago to Fond du Lac by this line is 152 miles, against 177 by the Northwestern's old line, (Wisconsin Division).

Lafayette, Muncie & Bloomington.

In the Tippecanoe (Ind.) Circuit Court it has been decided that the railroad act passed at the special session of the State Legislature, requiring railroad companies to issue stock paid for by corporations to taxpayers, etc., is unconstitutional, and is therefore null and void. The Court holds that the stock is the property of the whole people, and is held in trust by the County Commissioners. An appeal will be taken to the Supreme Court.

This decision will allow the whole amount of stock in this company taken by the counties of Benton, Tippecanoe, Clinton, Madison and Delaware, amounting to over $600,000, to be voted on at the next election by the Commissioners of those counties. It is said that this will probably result in an entire change of the management.

The completed portion of the road is leased to the Toledo, Wabash & Western.

Vermillion Valley & Northern Pacific.

Mr. J. H. Austin, Chief Engineer, has completed the preliminary survey of this road, which is to extend from Vermillion, Dakota, north to a connection with the Northern Pacific, a distance of about 300 miles. He reports that the road can be very cheaply constructed, especially the first 150 miles, on which the grading is exceedingly light and very few bridges will be required.

New Mail Route.

An extension of mail service has been ordered over the Texas & Pacific Railroad from Longview, Tex., to Dallas, 122 6 miles, at a yearly compensation of $9,808.

Providence & Worcester.

Through trains are to be run from Providence to Ashland, Mass., over this road and the Milford & Woonsocket and Hopkinton railroads.

Boston & Providence.

The third track has been completed for about a mile and one-half, between Hyde Park and Readville. The work on an additional mile, between Forest Hills and Mount Hope, is nearly completed.

Indianapolis, Cincinnati & Lafayette.

A telegram announces that this company has accepted the terms offered and will remove its shops from Cincinnati to Indianapolis.

Cairo & St. Louis.

At a meeting of the directors held in St. Louis, July 23, the contractor's time for completing the road was extended until January 1, 1874. Track laying will soon be commenced from Cairo, Ill., northward.

Boston & Lowell.

Work has been commenced on the new freight yard and depot at Lowell, Mass.

Nashua & Rochester

The contract for laying the track from Rochester, N. H., and Epping, has been awarded to Wait Hurlbut, of Underhill, Vt.

Bennington & Glastenbury.

There is talk of extending this road from its present terminus at Glastenbury, Vt., east to the Connecticut River.

Colorado & New Mexico.

Articles of incorporation of this company have been filed in the territories of Colorado and New Mexico. The road to be built is from the western terminus of the Atchison, Topeka & Santa Fe road in a westerly and southwesterly direction through the counties of Bent and Las Animas, in Colorado, to Santa Fe in New Mexico; and also a road from the most suitable point on said line through the counties of Bent and Las Animas to Trinidad, and also a road to Pueblo. The incorporators (who are all connected with the Atchison, Topeka & Santa Fe Company) are: Joseph Nickerson, Isaac T. Burr, Thomas Nickerson, Alden Speare, O. W. Peabody, Geo. P. Wilbur, Benj. P. Cheney, Chas. W. Pierce, Henry Strong, J. S. Nickerson and A. B. Lawrie, all of Boston, Mass.

Suits to Recover Taxes.

The Columbus, Chicago & Indiana Central Railroad Company has brought suit to recover from the United States Collector of Internal Revenue about $57,000, which, it is claimed, has been erroneously assessed upon the company. The Columbus & Hocking Valley Company has brought a similar suit to recover about $6,000.

Iowa Railroads.

The Dubuque (Iowa) *Times*, after speaking of the recent sale of the Des Moines Valley road, makes the following comments on the condition of other Iowa roads:

"The Central Railroad of Iowa seems to be fast reaching the condition of the Des Moines Valley. Its directors have just issued a circular to the bondholders, declaring that the earnings of the road for the past year were less than the cost of operating, and that, therefore, although they were compelled to pass the April payment of interest upon the second-mortgage bonds, they are now again compelled to pass the July interest upon the first mortgage. The floating debt is also more than $950,000, of which more than one-half, or $524,000, is for money advanced to pay previous interest. They also declare that the road cannot be properly worked without a large increase of equipment; and that 33 miles of it is practically useless without the construction of 31 miles of new line, and means to provide this must be provided.

"The Dubuque Southwestern Railroad is only bonded for about $10,000 per mile, and although it has been thus far enabled to pay interest upon its bonds, it has not for years, if ever, paid a cent in the way of dividend upon its capital stock. A surplus which it had on hand last year enabled it to pay the last installment of interest due on its bonds; but it is exceedingly doubtful if it will be enabled to meet the next coupons due, and thus far, this year, it has been unable to pay its taxes in some of the counties.

"According to the best information we can get, the Chicago, Clinton & Dubuque and the Chicago, Dubuque & Minnesota present no greater indications of profit. The river competition keeps their schedules down to low rates, and their receipts, in comparison with their earnings, give no evidence of a balance on the right side. If they earn sufficient to pay running expenses and interest upon their bonds, for a few years to come, we apprehend that the directory will be well satisfied.

"Even the Illinois Central reported the expense of its Iowa Division $40,000 more last year than its receipts, and the gross earnings of its Western Division are given at only $1,837.12 per mile—hardly enough to pay running expenses, to say nothing of rental and repairs.

"The Davenport & St. Paul Railroad reports gross earnings of only $837.71 per mile, and, with its increased length, will not for some time earn enough to pay its taxes and the coupons on its bonds.

Even the Sioux City & Pacific, with its government subsidy in bonds and lands, has not, we understand, paid a dollar of dividend to its stockholders.

"The Burlington & Southwestern, the Chicago & Southwestern, the Iowa Midland, the Sabula, Ackley & Dakota, and the Sioux City & St. Paul, are all in a condition other than profitable to their stockholders. Not one of them has paid a cent of dividend upon its stock."

Kansas Pacific.

Tracklaying on the Arkansas Valley Branch, which is to extend from Kit Carson, Col., southwest to Fort Lyon and Pueblo, was commenced July 26. The work is said to be going forward rapidly.

New Stock Yards near New York.

The New Jersey Abattoir Company, which already owns a large place on the New Jersey Central at Communipaw, is building a very large slaughter house on the meadows west of the Hackensack River, about three miles from Jersey City. The main building is to be 1,000 feet long and 150 feet wide, and there are several smaller buildings. It is said that a track will be laid to connect with the Pennsylvania Railroad.

Wisconsin.

Mr. John W. Cary, one of the directors of this company, which was organized to take the St. Croix land grant and build the roads required, has written and published a letter explaining the cause of the delay to be the unreasonable and unwarranted requirements of the Governor of Wisconsin, who insists that the company shall forfeit $5,000 for every mile unfinished, the conditions being that they shall construct sixty miles by the 17th of March, 1874, and forty miles each succeeding year, and refuses to make a contract which will leave the company free from obligation in case the land grant should turn out not to be at the State's disposal. Though the company may grade and buy the iron for the first sixty miles, should they fail to have it in running order by March 17, they are liable to a forfeiture of $250,000. The company is willing and ready to deposit the necessary security and commence work at once, as soon as the Governor modifies his views.

Hudson Suspension Bridge & New England Railroad.

This company has already begun to make surveys for its bridge across the Hudson at Poughkeepsie. Engineers are making examinations of the river bed at that point. It is thought that the piers for the bridge can be built at a moderate cost, the nature of the ground being favorable.

South Mountain.

It is stated that this company has secured the capital needed for the completion of the road from parties in Boston and from the Pennsylvania Railroad Company. Work is being pushed forward, and it is expected that the grading from Harrisburg to Hamburg will be ready for the rails next spring.

It is proposed to build a branch from Rehrersburg through Bernville to Reading. This branch would be about 20 miles long.

The road is to extend from Harrisburg, Pa., northeast through Hamburg to the Delaware River, where it will connect with the South Mountain & Boston road in New Jersey. The section now under construction is from Harrisburg to Hamburg, about 46 miles.

The Pennsylvania Air Line to Washington.

Trains are now running regularly on this line as now constituted, that is over the Philadelphia, Wilmington & Baltimore road between Philadelphia and Baltimore, and thence by the Union Tunnel and the Baltimore & Potomac road to Washington. Three trains by this line leave New York daily, at 8:50 a. m., 3:20 and 9 p. m.

Trains continue to be run as before over the old line by the Baltimore & Ohio road.

Montclair.

The appointment of the trustees by the Chancellor of New Jersey last week was the result of a compromise between the officers of the company and its creditors. It is stated that matters are to be so arranged that the road can be completed to Middletown, N. Y., and permanently leased to the New York & Oswego Midland Company. It is difficult to see how anything can be done without a sale of the road.

By itself the road is not a very valuable property. The upper portion passes through a mountainous and thinly inhabited country which can never give a large local traffic, while on the lower end of the line it is subject, at every point where there is likely to be much traffic, to competition from older roads. The road has already cost over $100,000 per mile, and considerable expenditure is still needed to complete it.

New Jersey Southern.

Some trouble was caused recently by the Pennsylvania Railroad Company's sending an excursion train from Philadelphia to Long Branch by way of Monmouth Junction and Farmingdale. The New Jersey Southern refused to take the train from Farmingdale to Long Branch, claiming that the sending the train by that route was a violation of the existing contract, by which all travel from Philadelphia and South Jersey to Long Branch was to be turned over to the New Jersey Southern at Pemberton Junction. It was also reported that, the contract being violated, the New Jersey Southern was freed from its agreement not to extend its road from Pemberton Junction to Camden, and that steps should be at once taken to build such extension. The dispute, however, has been adjusted, and matters are proceeding as before.

National.

A meeting of the stockholders of this company was held in Trenton, N. J., July 28, to consider certain propositions made by parties in New York who are interested in the enterprise. The action taken by the meeting, if any, has not been made public. It is asserted by some of the stockholders that the company is now in a prosperous condition and that work will shortly be resumed.

Harlem River & Port Chester.

Mr. H. G. Schofield, Engineer of the Harlem River & Port-Chester Railroad, received bids until Thursday of this week for the construction of a depot building 30 feet by 300 feet 8 inches on the company's wharf on the Harlem River, and also for a building 20 by 60 feet on the line of the road at Hunt's Point.

Chicago & Michigan Lake Shore.

It is announced that this company has failed to pay the July interest on its bonds, which were held chiefly in Boston and New England. The amount of bonds issued on the first of January last was reported at $5,350,000, and the net earnings on the part of the road operated, the average having been 170 miles, were $218,499.67, which is a trifle more than 4 per cent. on the bonded debt. A large share of the traffic of the road is lumber, which can only be carried at very low rates, on account of the competition on the lake, and much of the country on the line is thinly peopled, though growing.

The Portland Company.

A fire in this company's locomotive and car works in Portland, Me., on the morning of July 26, destroyed a paint shop 200 feet long, a car shop, some smaller buildings, a quantity of lumber, and a considerable quantity of unfinished work, and damaging three locomotives two of which belonged to the Intercolonial Railway. The President estimates the loss at $40,000, and says that the car shops will be rebuilt in better shape and a better location, and that a dividend just declared will be promptly paid. The Portland Company has in hand a contract for a very large number of locomotives of standard gauge for the Grand Trunk Railway, which will hardly be delayed by the fire, however, as the locomotive shops seem not to have suffered from the fire.

Green Bay & Lake Pepin.

Work on the western end of the road from Merrillan, Wis., to Winona, Minn., is being pushed forward. The road will connect with the La Crosse, Trempealeau & Prescott about five miles from Winona, and arrangements have been made for the use of the track of that road into Winona.

European Prices of Bonds.

Frankfort dates of the 12th of July give the following prices in some of the leading money markets of American bonds, many of which are not quoted here. The prices are in gold, of course: In Frankfort: U. S. 5-20's of '68, 98¼; New York city currency 7's, 92; Alabama & Chattanooga 8's, 37⅜; Buffalo, New York & Philadelphia 7's 58½; Cairo & Vincennes, 7's, 64½; California Pacific 6's, guaranteed by the State of California, 89½; California Pacific 7's, 65; California Pacific Extension 7's, 60¼; California & Oregon 6's, 68¾; Central Pacific 6's, 83¾; Western Pacific 6's, 72⅛; San Joaquin Valley 6's, 68½; Chicago, Burlington and Quincy 4½'s, 69¼; Chicago & Southwestern 7's, 71; Grand Rapids & Indiana 7's, 90½; Kansas Pacific 7's, 72; Lexington & St. Louis 6's, 51½; Missouri Pacific 6's, 68⅜; South Pacific 6's, 61⅛; Mobile & Ohio 7's, 81⅞; New York & Oswego Midland 7's, 67½; Oregon & California 7's, 20½; Rockford, Rock Island & St. Louis 3½'s (changed from 7's), 29; St. Louis & Southeastern 7's, 59½; Union Pacific, Eastern Division, gold 6's, 66½; Omaha Bridge 8's, 81½.

At Berlin on the 11th, Peninsular of Michigan was quoted at 26¼; Port Royal, 44½.

At Amsterdam on the 10th, Maxwell Estate was quoted at 34; Illinois Central, 91½; Chicago & Northwestern shares, 73½ (preferred, doubtless); Chicago & Northwestern, Madison Extension 7's, 83¼; Chicago & Northwestern, Menomonee Extension 7's, 81½; Winona & St. Peter 7's, 80; St. Paul & Pacific, issue of 1869, 30⅜; St. Paul & Pacific, Vincent and Brainard Extensions 7's, 26⅝; Atlantic, Mississippi & Ohio 7's, 54¼; Atchison Branch of Chicago & Southwestern 7's, 34; Missouri, Kansas & Texas 7's, 64½; Milwaukee & St. Paul shares, 62½.

British Rail Exports.

The returns of the British Board of Trade shows that the rail exports to the United States for June last were 18,016 tons, against 37,978 for the same month in 1872, and 44,919 tons in 1871. The total rail exports for the same time were 72,692 in 1873, 81,164 tons in 1872, and 103,052 tons in 1871.

For the half year ending with June the exports of rails to the United States were 120,468 tons in 1873, against 259,011 in 1872 and 244,784 in 1871. The total exports were 476,191 in 1871, 448,042 in 1872 and 347,757 in 1873. We have thus taken less than half as many rails this as last or the year before, and our total imports would be only about sufficient for the track of 1,200 miles of new line, or the maintenance of about 17,000 miles of average old railroad.

New York Central & Hudson River.

The work on the new tracks is progressing rapidly. The grading is already completed for about 70 miles and it is expected that 250 miles, or about five-sixths of the work, will be graded this fall. The tracks are to be laid with English steel, it is said, 60,000 tons having been purchased.

Large additions are being made to the yards at Buffalo, Rochester and Syracuse. At West Albany the new track will be laid some distance south of the shops and will be used for the passenger trains, the present tracks through the yards being kept for freight. The work is being done under the authority given by the general railroad law of New York State. To construct the cut-off, or short line by which the new tracks pass around instead of through Syracuse, a new company was organized under the law, which will construct the cut-off and then lease it to the Central. This was done in order to avoid any possible trouble which might arise.

Ground was broken July 24 for the new Union depot for this road and the Lake Shore at Buffalo. The new depot, which will be of brick, and 261 feet in width with proportionate length, is on William street in the eastern part of the city. Mr. Henry Rumrill, of Buffalo, is contractor for the masonry, and Mr.

Joseph Churchyard for the carpenter work. The work is to be pushed forward as fast as possible.

Staten Island & New Jersey Suspension Bridge & Railroad.

This company was chartered by the last Legislature of New York and, it is said, is preparing to commence operations. The plan proposed is stated to be to cross the Kill von Kull from New Brighton, on Staten Island, to Constable's Hook, on the New Jersey shore, by a suspension bridge of about 1,000 feet span, and to run thence along the west shore of the bay to Jersey City. It is proposed to make the bridge 125 feet above high water and to provide a carriage way in addition to the railroad. From New Brighton the railroad is to run southward to Tottenville, where another bridge is to be built across Arthur Kill to Perth Amboy.

The project of connecting Staten Island with Jersey City is an old one, but, we believe, has never before progressed so far as the organization of a company or the securing a charter. The incorporators of the present company are Henry G. Stebbins, William A. Garner, John C. Green, William Butler Duncan, Daniel Lowe, R. W. Cameron, J. H. Vanderbilt, Tompkins Westervelt, Amos Clarke, jr., Charles Butler, Charles K. Hamilton, Thomas Bond, Richard Patrick, William H. Pendleton, David W. Judd, John A. Austin, William H. Davidge, and James Guthrie Hamilton.

Freight Rates Westward.

A large reduction in first class rates has been made, equivalent generally to about 25 per cent., making the rates from New York 75 cents to Chicago, 49 to Cleveland, 70 to Cincinnati, 97 to St. Louis, 86 to Louisville, and $1.35 to Memphis.

Philadelphia & Reading.

Surveys are being made for a new line on the north bank of the Schuylkill from Norristown, the terminus of the Philadelphia & Norristown Branch, to Perkiomen Junction, a distance of about seven miles. The building of this line in connection with the extension (now under construction) of the Perkiomen road from its present terminus at Green Lane to Emaus on the East Pennsylvania road, will give the company another line to Reading entirely distinct from the present road.

Cleveland, Columbus, Cincinnati & Indianapolis.

Reports have been current in New York that this company would pass its usual semi-annual dividend. The dividend has, however, been declared, as usual. The reports are said to have originated with parties in the Atlantic & Great Western interest who are trying to secure sufficient stock to control the road and vote in favor of a lease to that company. It is also said that these parties have been able to secure only 33,000 out of 150,000 shares. Under the present law of Ohio no agreement for lease or consolidation can be made without the assent of two-thirds of the stock. We noticed last week the loan which the Atlantic & Great Western brought out for the purpose of securing a majority of the stock, in the announcement of which it was stated positively that agreements had been made for securing such a majority. With a majority of shares in the possession of the Atlantic & Great Western Company, the other will not need to lease the road, but can work it with its own officers, and to suit its own purposes. If these purposes do not coincide with the desires or interests of the "Bee Line" stockholders, the minority will find it hard to help themselves.

Delaware, Lackawanna & Western—Morris & Essex Division.

The report that a contract had been let for the new road through Bergen Hill is contradicted. It is said that there will be some difficulty about obtaining the right of way, as owners of property on the hill which will be required for the road have already put an exorbitant price on their land. The land will probably have to be condemned, and, in any case, it will be some months before the question of right of way can be settled.

Lake Shore & Michigan Southern.

This company's sinking fund loan of $6,000,000 has been all disposed of, and the proceeds will probably enable the company to complete the contemplated improvements. It is worthy of note that this loan, which is not secured by mortgage, and bears only the usual interest of 7 per cent., sold readily at 94. Evidently there is still money for investments in which investors can have perfect confidence, and no property is so sure to pay interest as one which earns net two or three times the amount of its obligations.

Wisconsin Central.

All the towns on the line of the road from Stevens' Point south to Portage have voted the aid asked from them, and it is thought that work will soon be begun on that section of the road, which will be about 70 miles long. It will be a branch from the main line.

La Crosse Bridge.

Mr. Anthony Jones has been appointed Engineer to make the necessary surveys and to prepare plans and specifications for the bridge across the Mississippi at La Crosse, Wis. The surveys are to be commenced at once.

Portsmouth, Great Falls & Conway.

At the annual meeting, held in Portsmouth, N. H., July 15, the stockholders voted to accept the act recently passed by the New Hampshire Legislature authorizing the construction of a connection with the new Portsmouth & Dover road. It was also voted to increase the capital stock by $150,000.

Dividends.

The Portland Company, at Portland, Me., paid a dividend of 5 per cent., August 1.

The Cleveland, Columnbs, Cincinnati & Indianapolis Railway Company has declared the usual half-yearly dividend of 3½ per cent., payable August 15.

Chesapeake & Ohio.

This company has made an arrangement with the "Clyde line" of steamers, which run between Richmond and Boston and Providence for carrying freight to and from the railroad. The same vessels of the same line of steamers connect the railroad with Philadelphia and "Old Dominion" line to New York. Through bills of lading are given from Boston, Providence, New York and Philadelphia by way of these steamers, the Chesapeake & Ohio Railroad and Ohio River steamboats to all points on the Ohio and Mississippi below Huntington, and also to Nashville, and the railroad company hopes to cultivate in this way a considerable through traffic in cotton, tobacco, etc.

Grand Rapids & Indiana.

At the annual meeting of this company in Grand Rapids, Mich., recently, it was stated that but $200,000 of the $1,250,000 equipment bonds authorized last year had been issued, and that, owing to dissatisfaction, the Continental Improvement Company had bought them in and proposed to turn them over to the railroad company, taking the equipment in lieu thereof, provided the stockholders agreed. The stockholders approved this action. It was stated that there were 996 freight cars on the road, and that a large increase in equipment was needed.

It is expected that the road will reach Little Traverse Bay, the end of the land grant, by October 1.

Petersburg.

A number of the stockholders of this company have filed a bill in the Circuit Court at Richmond, Va., asking for an injunction to restrain the President, Reuben Ragland, from continuing to manage the road, and also for the appointment of a receiver to take possession of the road and operate it. The bill alleges that the persons now in possession of the road voted themselves $250,000 as back dividends on stock which they claimed to own, and an annual salary of $12,000 to Ragland as President. It also charges misappropriation of the proceeds of bonds amounting to $500,000, for building the branch road from Petersburg to City Point, and demands from defendants a full explanation of these operations in connection with the management of the road. The case will be heard on Friday of next week.

European & North American.

It is said that the contract between this company and the Eastern and Maine Central combination was signed in Bangor, Me., last week.

New York, Boston & Montreal.

Work on the New York and Boston Division is said to be progressing steadily, and the company hopes to have the line from High Bridge to East Tarrytown open for local travel by September 1. A line of steamers will be put on to run from High Bridge to Wall street, New York, landing at several places.

Work has been begun on the repair shops at East Tarrytown.

The Boston & Maine and Maine Central Controversy.

Mr. N. C. White, President of the Boston & Maine Company, caused to be served upon the President of the Maine Central, July 17, a formal notice, demanding that the latter company should designate a point where connection should be made with the Boston & Maine road, and also that the same facilities for exchange of cars, and for billing through freights, ticketing passengers and checking baggage through to or from stations on the Maine Central should be granted to the Boston & Maine as are now given to the Eastern road. In default of compliance with this demand, the Boston & Maine Company threatened to make the connection, and if resisted by force to commence legal proceedings at once and to demand damages.

In reply, President Morrill, of the Maine Central, sent a long letter refusing to make the connection, or grant the facilities demanded. The letter goes over the whole history of the controversy between the companies, and charges the Boston & Maine with having heretofore demanded extortionate rates on Maine business.

Orders have been given to the Maine Central agent at Portland to resist, by force, any attempt to cut the tracks of the road for the purpose of making a connection with the Boston & Maine.

Missouri, Kansas & Texas.

This company's lines are now divided for operating purposes into six divisions as follows: the Missouri Division, from Hannibal, Mo., to Sedalia, 142 miles; the Sedalia Division, from Sedalia, Mo., to Parsons, Kan., 159 miles; the Cherokee Division, from Parsons, Kan., to Muskogee, Ind. Ter., 117 miles; the Choctaw Division, from Muskogee to Denison, Tex., 156 miles; the Neosho Division, from Parsons, Kan., to Junction City, 156 miles; and the Osage Division, from Holden, Mo., to Paola, Kan., 54 miles. The first four divisions constitute the main line.

It is said that the company is about to erect extensive slaughter houses at Denison, Tex. From that place a fast line of refrigerator cars will be run to convey the beef to New York and other Eastern cities. It is expected that a train will leave Denison every other day.

Des Moines Rapids Improvement.

At the recent opening of proposals for the excavation and embankment and construction of the embankment wall of the guard lock and canal and the channel at the entrance to the canal now in process of construction around the Des Moines Rapids, at the United States Engineer's office in Keokuk, Ia., July 21, seven bids were received. The amount of the bids ranged from $176,200 to $302,550, the lowest bidder being L. L. Hine, of Keokuk. The amount appropriated to be expended this year is $400,000. The contract has not yet been awarded.

Pennsylvania Petroleum.

It is said that the Atlantic & Great Western Company, which now leases the road, will soon resume the work, which has been suspended for some time, owing to misunderstandings with the contractors. The Titusville (Pa.) *Herald* thus describes the course and present condition of the road:

"The road, when completed, will start from Erie and run southwesterly through a fine agricultural country to Edinboro and thence to Cambridge, on the Atlantic & Great Western, along which road it will run parallel in an easterly direction to a point near French Creek. From here it will start in a southeasterly direction to Titusville, passing through Little Cooley, Clappville, Newton's Mills and Hydetown. From Titusville it will run parallel with the line of the Dunkirk, Warren & Pittsburgh road to the Johnson House, where it will cross the above line and continue its easterly course to Enterprise. Here it will branch off, one line running northeasterly to Tidioute and the other southerly through Pleasantville to Pithole, where it will form a junction with the Pithole Valley road, which is now the property of the Atlantic & Great Western Company. A considerable portion of the road is already graded and ready for the ties. Several miles of track are laid from Cambridge south. Most of the bridges are either completed or commenced between Cambridge and Pithole, and the entire road could with a limited force be placed in running order in six months."

Chippewa Falls & Western.

This company has filed its articles of incorporation with the Secretary of State of Wisconsin and proposes to build a branch line 12 miles long from the West Wisconsin road at Eau Claire, Wis., to Chippewa Falls. The capital stock is $160,000. A large part of the stock is subscribed and work is to be begun at once.

St. Joseph Bridge.

Colonel E. D. Mason, Chief Engineer, has just completed a survey of the Missouri River from the St. Joseph Bridge north to the rock bluff below Belmont, a distance of over four miles, with a view of ascertaining what further work in the river will be necessary to fully protect the bridge against even the possibility of a cut-off through the Elwood bottom opposite St. Joseph. As soon as the necessary maps illustrating the situation are prepared, they will be forwarded to the War Department for its information and approval. Until this is obtained, nothing definite can be stated as to the future operations. It is thought that the necessary protection can be obtained at a comparatively small cost.

Iola & Arkansas River.

This company, recently organized at Iola, Kan., proposes to build a railroad from Iola westward through Woodson, Greenwood, Butler and Sedgwick counties to the Arkansas River, a distance of 120 miles. The section from Iola to Kalida, 20 miles, is to be built at once. The capital stock is $2,000,000.

People's Narrow Gauge.

Mr. Estes, the Chief Engineer, makes the following report of the route surveyed for this road: "Commencing at Davenport on the west bank of the Mississippi, thence in a westerly direction up Blackhawk Creek to Blue Grass village in the center of the coal mines, thence to Wilton where it crosses the Chicago, Rock Island & Pacific road, thence through Tipton to Cedar Bluffs or Groves' Ferry, where the line crosses the Cedar River; thence to Solon, thence to Western, thence to Fairfax, thence to Norway, where the line crosses the Northwestern Railroad; thence northwesterly up Mud Creek to the summit lands, thence down the west branch of Salt Creek to the junction with the west fork, then up the west fork to the summit land; thence down Crystal Creek to Deer Creek, thence up that creek on the east side of Union Grove to its source; then across Wolf Creek into Grundy County in a northwesterly direction passing about half a mile northeast of Willhelm's Grove to Blackhawk Creek up to its source, and across to the south fork of Beaver Creek; then up the creek, crossing the Central of Iowa at Abbott; then in a westerly direction to Iowa Falls, making the distance 179½ miles, having but one bridge of much importance, that is at the crossing of the Cedar River; no rock cutting; with a maximum grade of 53 feet to the mile, a remarkably cheap line for the distance."

Pacific Mail.

The board of directors having obtained an opinion from counsel to the effect that the company possessed power to issue bonds under a mortgage of its property real or personal, at a meeting held in New York, July 24, appointed the President a committee to draw up a plan for an issue of bonds, and to submit the same to the board. The President was also authorized to borrow a sum sufficient to meet present needs.

It is understood that the bonds to be issued will bear 7 per cent. interest in gold.

Northern Colonization.

A dispatch from Montreal, Canada, states that the contract for the construction of this road has been let. The whole amount is $4,220,500, or $20,750 per mile, exclusive of extra work. The contractor is a Mr. Abbott.

San Francisco & North Pacific.

It is proposed to extend this road from its present southern terminus at Donahue, on Petaluma Creek, 34 miles (by water) from San Francisco, southward to San Rafael, a distance of about 15 miles. Mr. Donahue, the owner of the road, has expressed his willingness to make the extension, provided the citizens of San Rafael will raise $125,000. The present length of the road from Donahue north to Cloverdale is 56 miles.

Los Angeles & Santa Monica.

It is proposed to build a narrow-gauge road from Los Angeles, Cal., west 14 miles to Santa Monica. It is said that the road can be very cheaply constructed and that a good landing can be made at Santa Monica.

Milwaukee & Nashua.

This company has filed articles of incorporation in Minnesota. That portion of the road in that State is to extend from the Iowa line in Fillmore County northeast to the Mississippi in Houston or Winona County. There may also be a branch to La Crosse. The capital stock of the company is to be $5,500,000. Its principal office is in Nashua, Chickasaw County, Iowa, and the incorporators are E. P. Greeley, Andy Felt, S. L. Eastman, Wm. B. Perrin and C. A. Greeley.

La Crosse Bridge.

By the contract made with the Bridge Company by the Receiver of the Southern Minnesota road and approved by the United States District Court, the toll to be paid is 3½ cents per 100 pounds. When the tonnage exceeds 110,000 tons per year passing over the bridge, the toll is to be gradually reduced until 600,000 tons pass in one year, when the toll is to be fixed at 1½ cents per 100 pounds. By this contract the Bridge Company agrees to begin work in three months and complete the bridge by May 1, 1875.

The final surveys are to be made at once, and the specifications made preparatory to letting the contract.

Laurens & Asheville.

A meeting was recently held in Charleston, S. C., to take action to secure the early commencement of work on this road. It is to extend from Laurensville, S. C., north to Asheville, N. C., about 60 miles.

Decatur & East St. Louis.

The Board of Supervisors of Macon County, Ill., has ordered suit to be commenced to recover $100,000, subscribed by the county some time since to the stock of the Decatur & East St. Louis Company, on the ground that the company has not complied with the terms of the subscription. This course taken by the board is said to be generally regarded as an attempt to repudiate the debt of the county.

Southern Minnesota.

La Crosse (Wis.) papers charge that the present management of the road by the Receiver is such as to drive business away from the road, and reduce the traffic to the lowest possible point. It will not bear much reduction.

Carthage Branch.

This projected road is to extend from Carthage, Tex., north about 30 miles to a connection with the Texas & Pacific at Was-Rom or Marshall. Efforts are now being made to raise money for the road.

Evansville & Louisville.

A company has been organized in Evansville, Ind., to build a railroad from that place to Louisville, Ky. Mr. William Heibman, of Evansville, is President, and George M. Priest, of Henderson, Ky., is Vice President.

Chicago, Augusta & South Atlantic.

Meetings have been held in Chicago in the interest of this company, which purposes to connect Chicago with Augusta, Ga., by a direct line of railroad. It is proposed to use some existing lines and to construct so much road as is needed to fill up the gaps between roads now built. There is a continuous line already able to carry four times the traffic it gets, and a new one would find it hard to live, doubtless.

THE SCRAP HEAP.

Railroad Manufactures.

The Brooks Locomotive Works at Dunkirk, N. Y., recently turned out a new locomotive called the "Jay Gould" for the New Jersey Southern road, having 17x24 inch cylinders and driving wheels 5 feet in diameter. This locomotive, which is intended for passenger service between Sandy Hook and Long Branch, is described as being very finely finished and ornamented. The cylinder casings, the dome casing, the bell and bell columns, the jacket bindings, and all the small brass work inside the cab are nickel plated. Wherever possible the iron work is polished, and the front of the smoke-box is ornamented with a head-piece representing a surf-bathing scene. The cab is of black walnut, finely finished, and the painting on the engine is very fine. The tender is painted black, with the New Jersey State arms on either side, and the name of the road in gold letters on the wings of the tank.

The Brooks Locomotive Works now employs about 450 men, and turns out seven locomotives a month, with a large number of orders on hand.

Fast Time.

It is reported that the special train on the Baltimore & Ohio road which carried the fire engines sent from Washington to the Baltimore fire last week made the distance between the two stations, 39 miles, in 35 minutes, which is at the rate of 67 miles per hour—greater speed than we have seen reported before, and one that will hardly be believed in on the authority of a mere newspaper report.